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SUMMARY OF RECENT ABSTRACTS *

VIII. TYPHUS GROUP OF FEVERS †

General

GUARDIOLA and PARETSKY (p. 1315) discuss the metabolic reactivation of rickettsiae by diphosphopyridine nucleotide; details should be sought in the original.

From a large series of experiments on pregnant animals of various kinds with rickettsiae and other organisms GIROUD (p. 142) concludes that these can be responsible for abortion, though not commonly for malformations.

Laboratory animals inoculated intraperitoneally with *R. tsutsugamushi* or *R. burneti* sometimes develop pulmonary affections which may be related to previous sensitization by antigens of viruses or bacteria; ROGER and ROGER (p. 879) think that generalized allergic reactions, which may be specific or non-specific, may favour the proliferation of rickettsiae in abnormal situations. By experiments on *R. conori* infection of rabbits they (p. 1213) produced evidence to suggest that the rash of typhus is due to an allergic reaction different from the mechanism causing fever.

Proteus OX19 Type. Vectors: Louse and Flea

It has been suggested that the plague of Athens recorded by Thucydides was ergotism, but MACARTHUR (p. 1211) rejects this view, and restates his reasons for thinking that it can only have been typhus.

TAYLOR *et al.* (p. 264) found positive results to complement-fixation tests with *R. prowazeki* antigen in up to 19·3% of sera from the Nile valley. Murine typhus exists there also. The pattern of incidence of louse-borne typhus is probably due to recrudescences of the Brill-Zinsser type, and there is danger of epidemic spread in a population lacking immunity, whose lice have shown signs of resistance to DDT.

* The information from which this series of summaries has been compiled is given in the abstracts which have appeared in the *Tropical Diseases Bulletin*, 1958, v. 55. References to the abstracts are given under the names of the authors quoted and the pages on which the abstracts are printed.

† For previous articles on typhus group of fevers in this series see the October issues of the *Tropical Diseases Bulletin* each year since 1939.

Investigations in various countries have suggested that there may be a particular periodicity in the recrudescences of typhus, and in Poland KOSTRZEWSKI (p. 383) has observed that the number of recrudescences in the first few years after illness is small, but that a very distinct rise can be detected after 10–15 years; there is no indication of a special seasonal incidence. In Lodz, Poland, NIEDZIELSKA (p. 491) observed a number of patients with typhus, many of whom were experiencing second attacks, the primary attacks having taken place 30–40 years earlier. The complement-fixation test with rickettsial antigen was positive, but the Weil-Felix reaction was positive in only just over half the patients. MITTERMAYER and KRATOCHVÍL (p. 642) refer to 6 cases of Brill-Zinsser disease in part of Czechoslovakia.

In an investigation of the interepidemic survival of *R. prowazeki* PRICE *et al.* (p. 994) recall previous isolations of the organism from lymph nodes of persons who 28–42 years earlier had migrated from Russia to the United States and had not been known to have been exposed to the disease in the interval, and from the blood of a woman with Brill's disease. They have found positive complement-fixation and neutralization tests in large numbers of people who left south-eastern Europe 25 years ago, but not in their children born in America. They show that 2 strains of *R. mooseri* retained their identity after many passages in monkeys and human lice, but that *R. prowazeki* inoculated into mice together with preparations from sonically disintegrated *R. mooseri* occasionally took on all the characteristics of *R. mooseri;* this transformation could be prevented by treating the extracts of *R. mooseri* with deoxyribonuclease. The authors are convinced that Zinsser's hypothesis that man may act as the interepidemic reservoir is correct, but they think that the activation of latent typhus infection in man requires some unknown factor in addition to an upset of the antibody-forming mechanism.

KRASNIK (p. 1095) shows that rickettsiae isolated from patients with sporadic typhus or with second attacks of the disease are serologically and biologically identical with strains from epidemic typhus.

BOVARNICK and ALLEN (p. 384) observed a reversible inactivation of the toxicity and haemolytic activity of typhus rickettsiae kept without substrate for several hours at 36°C.; this effect can be prevented by addition of certain nutrients.

WEISS and DRESSLER (p. 1094) show that prior exposure of tissue culture cells to 100,000 r of gamma radiation did not affect subsequent growth of *R. prowazeki* in them but that higher doses led to greater release of the rickettsiae into the surrounding medium, probably as a result of more rapid lysis of irradiated host cells.

Few studies have been made of the blood and bone marrow in typhus, but EL-GAMMAL (p. 21) in Egypt observed that the most constant change in the blood was a shift to the left in polymorphonuclear cells, and in the marrow a proliferation of the reticulum cells.

Having compared the Weil-Felix, Kudicke-Steuer and the complement-fixation (rickettsial antigen) tests in patients who had had typhus, in contacts and in healthy persons, COMBIESCU *et al.* (p. 1095) conclude that the complement-fixation test is the most useful. These workers (p. 995) describe the clinical features of primary attacks and of relapses of typhus in Rumania, noting that whereas the complement-fixation test with *R. prowazeki* antigen was always positive, the Weil-Felix was positive to a titre of 1 in 500 in

61% and 19% respectively. In general these cases were milder in most respects than those reported in previous epidemics; improved nutrition may be a significant factor.

PEREZ GALLARDO (p. 492) recalls the history of the avirulent strain E of *Rickettsia prowazeki* which is used as a vaccine. CLAVERO and the author in Spain were making routine yolk-sac passages of a fully virulent strain when at the 11th passage it was found to have lost its virulence but to have retained its immunizing properties; it has remained in that condition. Fox *et al.* (p. 492) tested the immunity developed in human volunteers after vaccination with living strain E, and found that the immunity persisted for at least 66 months, and probably for many years, in those who developed neutralizing antibodies. The strain E vaccine is safe, since Fox and JORDAN (p. 745) report that 20,000 inoculations have not produced any serious illness. They prefer the intramuscular route in doses of 0·25 ml. of 0·25–1% yolk-sac suspension having an initial infective titre of 7 $\log_{10}$ or more.

Human body lice spend most of their time in climbing over undergarments, and HOCKING (p. 22) has observed that fibres thicker than 200 μ could not be gripped by their claws. Garments made of such thick fibres would probably be uncomfortable next to the skin, but might be suitable as outer garments for persons engaged in louse control.

In part of Persia where typhus occurs and infestation with lice is common MCLINTOCK *et al.* (p. 1096) dusted the people with DDT and BHC. This was successful but louse resistance to BHC was found in some villages later, and this seemed to be linked with the frequency with which the insecticide was applied.

In Serbia VUKASOVIC *et al.* (p. 1212) have observed some increase in the resistance of lice to DDT, but no special resistant strains have been found.

VERMEIL *et al.* (p. 384) have established the presence of murine typhus in rats caught near the port of Tunis.

The composition of the cell wall of *R. mooseri* was investigated by SCHAECHTER *et al.* (p. 493); complement-fixation tests demonstrated the presence of a group-reactive antigen, and an erythrocyte-sensitizing substance was present in greater amount than in the rest of the organism. From a study of the loss of nucleic acids during incubation of *R. mooseri* COHN *et al.* (p. 642) conclude that inactivation of rickettsiae is a complex phenomenon involving the reversible depletion of diphosphopyridine nucleotide and the irreversible loss of nucleic acids. Different results are obtained at 36°C. and 4°C., and enzymatic processes are probably concerned in the nucleic acid loss which accompanies inactivation at 36°C. HARA (p. 1315) has devised a method of purification of *R. mooseri* by means of a cation-exchange resin.

In the southern United States SMITH (p. 878) found that the monthly abundance of *Xenopsylla cheopis* on rats was associated with the monthly incidence of typhus antibodies in both Norway and roof rats.

IMAMALIEV (p. 265) gives an account of the clinical features of the murine form of typhus as seen in Baku, and observes that incidence is highest between August and February.

WHITMIRE and DOWNS (p. 493) observed the effect of cortisone on infection of various laboratory animals with *R. mooseri*.

Proteus OXK Type. Vector: Mite

KOENOKI (p. 143) isolated rickettsiae from wild rats in Kyushu, Japan, which appeared to be *R. tsutsugamushi* of reduced virulence. JACKSON *et al.* (p. 494) in Korea found *R. tsutsugamushi* in a considerable number of wild rodents and in larval *Trombicula pallida* collected from them. Human cases of the disease were rare, however, and it seems probable that the vector for rodents (probably T. *pallida*) is only an occasional vector for man. In Fukien YU *et al.* (pp. 878, 1096) found *T. deliensis* on domestic rabbits; 16 of 64 rabbits examined were found to be infected with *R. tsutsugamushi*, and the infection was also found in pigs, rats, mice and a shrew.

WEYER (p. 746) inoculated *R. tamiyai* and *R. tsutsugamushi* into the haemolymph of lice, in which the rickettsiae multiplied and persisted, without showing affinity for any organ. *R. tsutsugamushi* is not viable in the cells of the digestive tract, and it therefore occupies an exceptional position among the rickettsiae pathogenic for man. *R. tamiyai* reacts like *R. tsutsugamushi*, and is probably not a true species.

An account of some of the trombiculid mites of Malaya is given in a volume of Studies from the Institute for Medical Research, Malaya (p. 951). SASA *et al.* (pp. 143, 385) studied the bionomics of certain trombiculid mite larvae on vegetation, in relation to their reactions to passing hosts; carbon dioxide and breath are factors leading to activity of the larvae.

Rickettsialpox

JACKSON *et al.* (p. 495) isolated *R. akari* from a field rodent in Korea, where rickettsialpox had not been recognized. This organism has hitherto been found only in commensal mice and rats, and the finding suggests a natural cycle independent of man and his rodent companions.

Indeterminate Type. Vector: Tick

In Nairobi HEISCH *et al.* (p. 144) isolated rickettsiae from *Haemaphysalis leachi* (from dogs, cats, a leopard and from burrows of *Otomys angoniensis*), *Rhipicephalus simus* (from a dog), and from *Amblyomma variegatum* (from a dog and cow). They also isolated them from *Otomys*. These strains were inoculated into 12 volunteers and produced some febrile reactions, but except in 1 case the Weil-Felix response was insignificant. This may have been due to prior infection since some of the subjects showed pre-inoculation antibodies to *Proteus OX19*. Isolated strains appeared to be closely related to the organisms of South African tick-bite fever.

LE GAC *et al.* (p. 1212) used a technique in which ticks and other ectoparasites were exposed to sera containing agglutinins for various rickettsiae; ticks infected with rickettsiae of epidemic or murine typhus, boutonneuse fever or Q fever were able to absorb the relevant agglutinins. In this way the authors showed that a single vector tick may possess several antigens.

QUINTANE (p. 643) reports a systematic enquiry into the distribution of boutonneuse fever in the Mediterranean basin; the original is illustrated with maps.

CHITI (p. 1097) treats boutonneuse fever with chloramphenicol with good results.

In complement-fixation tests on animals experimentally infected with Rocky Mountain spotted fever or murine typhus HERSEY *et al.* (p. 643) found that antibody was detected earlier when relatively large amounts of soluble antigen were used in the "cold-overnight" test. In tests on human subjects suspected of these diseases more positive results were obtained with increased amounts (8 units) of antigen than with the conventional 2 units.

Although inoculation of rats with the R strain of *R. rickettsi* did not produce signs of clinical infection, HARSHMAN *et al.* (p. 746) observed that daily injections of blood of other species (horse, sheep, guineapigs, man, etc.), after the inoculation, led to generalized infection. The factor which promoted infection was destroyed by heating to 100°C. for 5 minutes, and by other procedures, but was not dialysable, and was present in the supernatant fluid after freeze-thaw lysed cells had been centrifuged.

Q Fever

Serological reactions to Q fever have been found in 3 patients with atypical pneumonia in Rotterdam, but DEKKING and ZANEN (p. 1316) state that the infection is rare there, and is absent in the indigenous cattle. Serological reactions for Q fever were found in the province of Cagliari by CIOGLIA and MEDDA (p. 266), but they observe that the complement-fixation test and the precipitin test each detects only 70% of the positive results obtained when both are employed.

An epidemic of Q fever in a cotton factory in Czechoslovakia was traced by BÁRDOS *et al.* (p. 23) to 2 consignments of cotton; the highest incidence occurred in rooms in which most dust was created. The disease showed 2 forms, typhoidal and pneumonic, but treatment with chloramphenicol was dramatically successful. Serological evidence of infection with *R. burneti* was found in 2 species of shrews in Bohemia by SYRUCEK *et al.* (p. 386), and the organism was isolated from one pygmy shrew. SYRUCEK *et al.* (p. 1097) isolated *R. burneti* from the placentas of several women who had had Q fever some years earlier. In each case delivery was uneventful and the infants were healthy. Attempts to isolate the organism from the milk were unsuccessful.

COMBIESCO (p. 748) reiterates the point that Q fever may result from inhaling infected dust, and from drinking infected milk if it is fresh. The organisms are destroyed in yoghourt within 24 hours. Cutaneous and conjunctival routes of infection are also possible, but the part played by arthropods has still to be clarified. In an outbreak of Q fever in Rumania BUȘILA *et al.* (p. 747) conclude that the infection was principally air-borne by inhalation of dust from manure and wool. It affected shepherds, cowherds and people aged 50–60, which suggests that it is of recent appearance.

Q fever occurs in the Ural mountains, where BURGANSKII *et al.* (p. 25) think that it is probably first acquired by domestic animals from ticks in the pastures, and passed on to other animals and man by droplet and contact. In the Turkmen S.S.R. ZHMAEVA and PCHELKINA (p. 25) have isolated *R. burneti* from the brain and liver of fowls and from the shell and shell membrane of fowl eggs. Chickens may therefore be reservoirs of Q fever.

A series of papers in *J. Microbiol., Epidemiol. and Immunobiol.* (p. 1214) deal with several investigations on Q fever in Russia, where positive serological tests have been found in considerable proportions of people in the meat,

milk, tanning and wool industries and in cattle and sheep. The infection is common in rural areas, but is also present in Moscow. Positive results have also been found in healthy blood donors.

GIROUD *et al.* (p. 266) found *R. burneti* in a batch of *Amblyomma variegatum* in the Dakar region, and neorickettsiae were recovered from various other ticks in Morocco and other parts of Africa.

IRONS *et al.* (p. 495) report on 64 cases of Q fever seen in Texas in 1948–55. Most of the patients were associated with livestock, and dairy herds were found to be infected. Infection was probably contracted through breathing infected dust—attempts to isolate the organism from ticks were unsuccessful and tick transmission could not be established. In California Q fever is spread by raw milk, and pasteurization does not always completely destroy *R. burneti*. ENRIGHT *et al.* (p. 387) in laboratory tests found that heating at 143°F. for 30 minutes was inadequate, but at 145°F. for 30 minutes all *R. burneti* were destroyed; this was also true of heating in commercial conditions, and in these the normal HTST temperatures are close to the thermal inactivation points. Other dairy products with high fat content or added sugar require higher temperatures.

RYCHLO (p. 146) describes a method of staining *R. burneti* in histological sections. ROGER *et al.* (p. 1001) discuss the staining affinities of *R. burneti*; extraction with ether did not remove their affinity for methylene blue but greatly reduced their affinity for eosin and fuchsin.

SHINDAROV (p. 1098) describes a method for cultivating *R. burneti* to produce antigen.

Guineapigs infected intraperitoneally with large doses of *R. burneti* became highly sensitive to toxins of *Brucella suis*, *Escherichia coli* and *Salmonella typhi*; PIRSCH *et al.* (p. 388) suggest that this is a manifestation of the generalized Shwartzman reaction.

ABINANTI and MARMION (p. 147) studied the protective antibody in the serum of rabbits immunized against *R. burneti*, which is related to the complement-fixing antibody against phase I antigen.

LUTYNSKI and DOLEZAL (p. 148) used the Coombs test in the diagnosis of Q fever, the antigen being a suspension of *R. burneti*. Positive results were given in high titre by sera from persons convalescent from the disease.

Charles Wilcocks

MALARIA

In this section abstracts are arranged as far as possible in the following order:—Human malaria—*epidemiology, aetiology, transmission, pathology, diagnosis, clinical findings, treatment, control;* Animal malaria—*monkeys, other animals, birds.*

LUPAŞCU, G., DAHNOVICI, Valentina, ALEXANDRESCU, N., AGAVRILOAEI, Aspasia, SERBĂNESCU, G., MITITELU, P. & KECSKEMÉTI, S. Contribuţii la studiul malariei în bazinul hidrografic Crisul Alb. [**Contributions to the Study of Malaria in the Hydrographic Basin of the River Crisul Alb**] *Microbiol., Parazitol. si Epidemiol.* Bucharest. 1958, July–Aug., v. 3, No. 4, 339–57, 6 figs.

The authors have studied the incidence of malaria in the basin of the River Crisul Alb, an area of 425,000 hectares in Rumania. The disease is mostly confined to the rice-growing areas in the lowlands, which have been greatly increased in extent since 1949. Antimalarial measures, including spraying with insecticides, were introduced in 1949 and repeated in subsequent years. The annual number of cases then fell from 4,160 in 1949 (2·68% of the population exposed) to 1,404 in 1950 (0·9%), 458 in 1951 (0·29%) and 3 in 1953. *Plasmodium vivax* was found in 94·7%, *P. malariae* in 2·95% and *P. falciparum* in 0·9% of instances. *D. J. Bauer*

RADACOVICI, Ecaterina, *et al.* Studiul evoluţiei endemiei palustre în zona bazinului hidrografic al Dunării (Oltenița-Galaţi), în intervalul 1949–1957. [**A Study on the Evolution of the Malaria Endemic in the Hydrographic Basin of the Danube River, Oltenita-Galati, between 1949 and 1957**] *Microbiol., Parazitol. si Epidemiol.* Bucharest. 1958, July–Aug., v. 3, No. 4, 329–38, 1 folding pl.

In an investigation carried out in 1949 on 299,838 persons living in the flood plain area of the Danube in Rumania the mean incidence of malaria was found to be 7·2%, with values ranging up to 33% in several localities. A large-scale antimalarial campaign involving treatment of the area with residual insecticides was begun in the same year, and in 1952 the mean incidence of malaria had fallen to 0·9%, and in 1953 to 0·01%. *D. J. Bauer*

JEFFERY, G. M., YOUNG, M. D., BURGESS, R. W. & EYLES, D. E. **Early Activity in Sporozoite-Induced** *Plasmodium falciparum* **Infections.** *Ann. Trop. Med. & Parasit.* 1959, Apr., v. 53, No. 1, 51–8. [13 refs.]

The course of the infection of three strains of *Plasmodium falciparum* (two from South Carolina—McLendon and Santee-Cooper—and one from Panama) was studied in 161 neurosyphilitics; the malaria was induced by sporozoites in various forms (mosquito bites, intravenous inoculation of infected salivary glands, fresh or after storage at low temperature).

The prepatent period was about 10 days in the Panama and Santee-Cooper infections and 13 days in the McLendon, the actual length depending upon the sporozoite dosage: if this was high the period could be shortened to 6 and 9 days respectively. The incubation was usually a day or so longer than the prepatent period.

Gametocytes appeared 11 days after the first asexual parasites. The density of parasitaemia varied enormously, and the infection often had to be controlled by drugs; the usual maximum was found on the 7th, 8th or 9th day. The temperature rose to 105°F. in patients infected with all three strains, and showed a quotidian periodicity in the majority of cases, which later settled to a tertian rhythm. The Panama strain was the most virulent and often gave rise to a remittent or continuous fever. *P. C. C. Garnham*

VUKASOVIC, P., MARTINOVIC, A. & VUKOTIC, M. [**A Contribution to the Study of the Resistance of *Anopheles* to DDT in Serbia**] *Bull. Inst. Hyg.* Belgrade. 1958, v. 7, No. 1, 9–18. [In Serbian.] French summary.

A study of the resistance to DDT of *Anopheles maculipennis* var. *messeae* collected in Serbia has been made by the Busvine/Nash method [this *Bulletin*, 1953, v. 50, 1176]. The percentage mortalities observed in 204 mosquitoes collected in Vranja and exposed to DDT concentrations of 0·5, 1·0 and 2·0% were 36–50%, 49–68% and 60–100% respectively. In groups of 279, 257 and 321 mosquitoes collected in Belgrade and exposed to the 3 test concentrations the mortalities were 33·6, 79·7 and 95·6% respectively. In view of the incompleteness of the kill, further tests were carried out with DDT concentrations of 2·5 and 3·0%, and mortalities of 98·1 and 99·3% were observed in 2 groups of 160 and 165 insects. The percentage mortality was not increased by lengthening the time of exposure from 60 to 90 minutes, but higher percentages were obtained by observing the results after 48 hours instead of the recommended period of 24 hours. *D. J. Bauer*

CHASTANG, R. Quatre années de lutte anti-paludique au Cameroun méridional. [**Four Years of Antimalarial Measures in the South Cameroons**] *Méd. Trop.* Marseilles. 1959, Jan.–Feb., v. 19, No. 1, 51–86, 1 map & 2 diagrams. [19 refs.]

Malaria control by imagicidal measures in the French Cameroons dates from 1953, since when it has been instituted in successive areas, in which the epidemiology of the disease varies, and with different degrees of intensity of supervision. The campaign in the north has been very closely supervised, and is of the nature of an experimental project. The routine application of 2 gm./m^2 DDT every 6 months from 1953 to 1957 produced, however, no more than a moderate reduction in malaria incidence, and the original mechanism has given way to an experiment in combined chemotherapy and imagicidal attack and to an entomological research mechanism. In the South Cameroons control has been executive, together with a pilot project, and the results have been very variable. In the forest areas, where *Anopheles*

moucheti and *A. nili* are the natural vectors and *A. gambiae* and *A. funestus* are only superimposed on them, a high degree of success has been achieved; the superimposed vectors have virtually disappeared and transmission by the natural vectors is certainly greatly reduced, but even so with some persistence of parasites among both infants and children. In the more open areas of savannah or near savannah, in the valleys of the great rivers and lands subject to flood, the results have been even more discouraging, persistent parasite rates resembling those of a normal mesoendemic state with a marked preponderance of *Plasmodium falciparum* over other species.

In places the cause is sometimes easy to see, maybe of such a crude nature as failure to treat a village during one of the years of the campaign. In others it is much more difficult of precise definition, but the remedy would clearly involve a great elaboration of measures, certainly at greatly enhanced cost, and perhaps beyond the stage which could be carried by locally available facilities and communications. The potential value of the addition of surveillance—the deliberate search for and treatment of residual cases—is considered and in conclusion it is decided to incorporate it in the pilot project, but its novelty, experimental nature, and inherent difficulty under the conditions of Africa are stressed.

The optimistic conclusion in recent scientific works that eradication in the Cameroons is possible may be correct, but the path to it is studded with ambushes, and progress towards it would involve very large budgetary provision. *G. Macdonald*

VAN DIJK, W. J. O. M. **Mass Chemoprophylaxis with Chloroquine additional to DDT Indoor Spraying. Report on a Pilot Project in the Demta Area, Netherlands New Guinea.** *Trop. & Geograph. Med.* Amsterdam. 1958, Dec., v. 10, No. 4, 379–84, 1 map.

It has been shown by METSELAAR [this *Bulletin*, 1957, v. 54, 651] that indoor spraying with DDT in this highly malarious part of New Guinea greatly decreased but did not totally interrupt transmission. An experimental mass treatment, 8 successive weekly doses of 300 mgm. chloroquine base for adults and proportionately smaller doses for children, was therefore administered to the people of 24 villages, and their very full cooperation was secured, an average of 93% being available each time. The results are summarized in the table below, in which A refers to the period before spraying of insecticides, B to survey after the eighth round of insecticide but before mass treatment, C to the period immediately after chloroquine treatment, D to a survey 12 months later, and E to a correction of the last results for a slight change in age composition of the population since the previous survey. There was a sustained and marked diminution in *P. vivax* and *P. malariae* infections, though *P. falciparum* infections were not continuously reduced in such a dramatic manner. Further analysis showed that there had been a continuation of *P. falciparum* infections in two villages where the scheme failed, but if other villages only are taken into account the reduction in *P. falciparum* infections was also satisfactory. Apparently in these two villages

there had been no satisfactory approach to interruption of transmission by the insecticide.

Survey	No. examined	Parasite rate (%)	*P. falciparum* infect. rate (%)	*P. vivax* infect. rate (%)	*P. malariae* infect. rate (%)
(A)	2,781	41	17	14	15
(B)	3,893	11·2 (2·8)	4·1 (1·1)	1·4 (0·4)	6·4 (1·1)
(C)	4,301	0·1	0·1	—	—
(D)	2,022	3·4	2·4	0·1	0·9
(E)	(3,570)	2·3 (1·3)	1·8 (1·1)	0·1 (0)	0·5 (0·1)

(*Between brackets the gametocyte rates.*)

G. Macdonald

ERRATUM

It is regretted that the first sentence of the abstract of the paper by A. Martinez Palacios [this *Bulletin*, 1959, v. 56, 517] is incorrect. The sentence should be replaced by the following:—

> "Indoor sprayings were carried out by CNEP [the National Commission for the Eradication of Malaria] twice in 1957 with DDT and once early in 1958 with dieldrin in Temixco, a rice-growing area of Mexico with 822 houses. This area had been sprayed previously by other agencies annually from 1945 to 1949."

See also p. 1047, Giglioli, **An Outline of the Nutritional Situation on the Sugar Estates of British Guiana in respect to the Eradication of Malaria. Recent Developments in the Production of Green Vegetables and Fruit by Individual Family Units.**

Huff, C. G. **Further Studies on Host-Cell Preferences by Exoerythrocytic Stages of Avian Malaria.** *Exper. Parasit.* New York. 1959, Apr., v. 8, No. 2, 163–70.

The incidence of exo-erythrocytic schizogony in avian malaria varies in different circumstances, probably as the result either of depletion in the host of essential metabolites or of the advancing immunity. Experiments (inconclusive in the results) to test these hypotheses were carried out as follows.

Chickens were infected with *Plasmodium fallax* or *lophurae* and, on recovery, with *P. gallinaceum*; the density of exo-erythrocytic forms of *P. gallinaceum* during the first 10 days was the same as in control birds. Similarly, the inoculation of homologous serum hyperimmune to *P. lophurae* and *P. gallinaceum* respectively failed to alter the pattern of the tissue forms. Sporozoites of *P. gallinaceum* were exposed *in vitro* to hyperimmune serum for an hour and were then injected into chickens: no exo-erythrocytic parasites were encountered on the subsequent 5 days.

Immunization of turkeys by killed *P. fallax* was followed by the inoculation of living forms, but here again the course of exo-erythrocytic schizogony was unaffected. Tissue cultures of *P. fallax* were inoculated into turkeys and the

course of infection was watched by killing birds at various intervals: the parasites retained their affinity for endothelial cells and little invasion of the blood occurred; exo-erythrocytic forms first appeared on the fourth day in the lung and spleen and became widespread in the body during the next 4 days, after which they disappeared. *P. C. C. Garnham*

TRYPANOSOMIASIS

*In this section abstracts are arranged as far as possible in the following order:—*African—*human, animal;* American—*Chagas's disease and other trypanosome infections. In each form the following order is followed:—epidemiology, aetiology, transmission, pathology, diagnosis, clinical findings, treatment, control.*

West African Institute for Trypanosomiasis Research. Kaduna. **Annual Report 1958** [Nash, T. A. M., Director]. pp. iii + 35. 1959. London: Crown Agents for Oversea Governments & Administrations, 4, Millbank, S.W. 1.

This very interesting report begins by commenting on the administration and on the staff. The description of the year's work deals first with human trypanosomiasis. The strains of *Trypanosoma gambiense*, *T. rhodesiense* and *T. brucei* maintained in the Institute are the same as those reported last year [this *Bulletin*, 1958, v. 55, 1082] with the exception of the last which was isolated recently. The study of factors and techniques influencing infection of *Glossina palpalis* with *T. gambiense* was successfully pursued with the aim of increasing the infection rate in laboratory colonies. The correlation of trypanosome morphology with periodic fluctuations in parasitaemia was further investigated. Experiments are in progress to test whether resistance to *T. gambiense* is created by previous infection with other trypanosomes. It was also shown that on the addition of certain trypanocidal drugs to cell-free extracts of trypanosomes an insoluble compound with the drug forms, which denatures the protein. Further investigations were carried out on electrophoresis of trypanosomes homogenized in distilled water.

In research on animal trypanosomiasis further investigation was made of the *T. congolense*-like organism tentatively named *T. dimorphon* (?). Biometrical comparisons with the original slides of the species indicate that it is intermediate in length between *T. congolense* and *T. dimorphon*. It is lethal to oxen and it killed one-third of sheep infected. Rats inoculated with this trypanosome failed to become infected if fed with cod-liver oil whereas controls not receiving the oil died.

The resistance of 2 calves, an N'Dama and a Zebu, was tested by trypanosome challenge 3 months after birth and monthly thereafter. Surprisingly the Zebu appeared the more resistant. A horse experimentally bitten by *G. palpalis* infected with *T. vivax* suffered a severe infection but recovered with treatment. Experiments on suramin complexes with Prothidium and RD 2902 yielded protection for 3½ months only but with less swelling than previous preparations and no skin necrosis. Two new drugs were tested, and toxicity

was studied by inoculating certain fluorescent trypanocidal drugs into anaesthetized animals and studying their distribution in the viscera under ultra-violet light. A test is being developed in sheep to detect and indicate the degree of drug resistance in trypanosomes from tsetse flies in different areas.

Research on the insect vector was carried on at Ugbobigha where the epidemiological differences between *G. palpalis* in the dry north and the humid south were investigated. Reproduction rates were lower in the south because of abortion. The ecology of *G. longipalpis* was studied and an investigation of the *fusca* group was made. Since numbers were less affected fly marking and release were substituted for catching and killing in population studies of the latter group. In laboratory colonies *G. medicorum* was found to be more robust than *G. fusca* and *G. tabaniformis*. Natural infection rates for members of the *fusca* group are reported. Identifications of blood meals of the different species in various areas are reported with some curious findings in the south; the duiker, which is ubiquitous, does not appear to be a host of any species though it has been recorded rarely in the north. The *fusca* group are mainly pig-feeders.

Luminescent paint on tsetse and fluorescent light, were used in an attempt to find *G. palpalis* resting places, but this was only successful in the case of flies released just before dark at the end of the wet season. Those found were on the upper surface of small leaves, usually 1 to 4½ feet from the ground. Laboratory colonies of *G. palpalis* and *G. morsitans* showed slightly better reproduction than in previous years.

There are 4 short appendices dealing with scientific publications, accounts and other matters. *T. H. Davey*

GREWAL, M. S. **On a New Trypanosome from the Blood of an African Gecko, *Hemidactylus brookii angulatus* Gray, 1845.** *Res. Bull. Punjab Univ.* 1957, May, No. 106, 269–81, 3 pls. [33 refs.]

DIAZ VAZQUEZ, A. **Enfermedad de Chagas.** [Chagas's Disease] [Thesis.] 2nd edition. 172 pp., 36 figs. on 36 pls. [Numerous refs.] 1957. Merida: Universidad de Los Andes, Venezuela.

This monograph from Merida, Venezuela, formed the subject of a doctoral thesis and is a documented account of the various aspects of Chagas's disease with particular emphasis on experience of it in Venezuela.

In successive chapters, each followed by a considerable bibliography, the author discusses the history of the disease; epidemiology and incidence, with a general account of the vectors and vertebrate hosts in Venezuela (15 species of triatomids are listed for that country); the distribution of the triatomids in each State; aetiology and description of the parasites; clinical features; pathological anatomy; diagnosis; prognosis; treatment; prevention. This last chapter outlines the measures used in Venezuela for control of the disease.

There are 36 illustrations comprising photographs, photomicrographs and drawings, illustrating some of the features described in the various chapters. This is a useful account of the disease in Venezuela and will be of value to those who read Spanish. *H. J. O'D. Burke-Gaffney*

BIAGI F., F. *et al.* Enfermedad de Chagas en Tutuapan, Estado de Mexico. [**Chagas's Disease in Tutuapan, Mexico**] Reprinted from *Prensa Med. Mexicana.* 1958, Nov.–Dec., v. 22, Nos. 11/12, 3 pp., 2 figs.

The English summary appended to the paper is as follows:—

"A great number of homes infected with *Triatoma phyllosoma pallidipennis* were reported in Tutuapan, Mexico and 68·4% of these were shown to be infected by *Schizotrypanum cruzi.* Eighteen per-cent (18%) of the inhabitants showed the antecedent of Romaña's sign. Electrocardiograms showed evidence that could be related to Chagas disease. During this study a very illustrative clinical case was found whose parasitological diagnosis was not proven. In a total of 87 xenodiagnoses examined, one case of Chagas disease was confirmed.

"An endemic focus of Chagas disease was demonstrated to be present 70 miles from Mexico City, in which there was evidence of the disease in man.

"A series of programmatic tests through xenodiagnosis is required to evaluate correctly the problem of Chagas disease in Mexico."

TEJADA, A. & LLANOS, Bertha. Presencia del *Triatoma infestans* en la ciudad de Lima. [**Presence of** *Triatoma infestans* **in the City of Lima**] *Rev. Med. Exper.* Lima. 1958, Dec., v. 12, Nos. 1/2, 90–98, 2 figs. & 1 plan. [14 refs.]

The English summary appended to the paper is as follows:—

"*Triatoma infestans*, the vector of Chagas' disease, has been detected in ten houses situated in the poor section of Lima. Ninety-nine specimens (adults and nymphs) and 148 eggs were collected.

"No *Trypanosoma cruzi* were isolated from any of the intestinal contents or feces of the specimens.

"This is the first instance in which *T. infestans* has been found in the city of Lima. It is believed that this new focus of infestation found its origin in the southern part of Peru, where many localities are infested with *T. infestans.*"

LUMBRERAS, H., FLORES, W. & ESCALLÓN, A. Allergisch Reaktionen auf Stiche von Reduviiden und ihre Bedeutung bei der Chagaskrankheit. [**Allergic Reactions after Bites of Reduviid Bugs and their Significance in Chagas's Disease**] *Ztsch. f. Tropenmed. u. Parasit.* Stuttgart. 1959, Apr., v. 10, No. 1, 6–19, 4 figs. [Numerous refs.]

These authors were led to undertake experiments on the genesis of Romaña's sign in Chagas's disease by a series of circumstances. In 1951 the senior author was sensitized by the bite of a laboratory-reared *Triatoma infestans.* The local reactions were characteristic with papules, congestive oedema and pruritus. 6 years later he was bitten again by a larva of *Rhodnius prolixus* on the tibial malleolus. The consequent reaction was the same, but more prolonged. This was regarded as a sign of sensitivity to *Rhodnius* as he had

been bitten extensively by first-stage larvae 7 years previously. The 3 authors (A, B and C) of this paper experimented on themselves, using *R. prolixus*, *Triatoma infestans*, *Panstrongylus megistus* and *Triatoma dimidiata*, all reared in the Tropeninstitut in Hamburg and hence free from any *T. cruzi* infection.

A, already sensitized to *R. prolixus*, was bitten by this species on upper eyelid, forearm and ankle, and similar reactions resulted. He was then bitten in November 1957 by *P. megistus* and *T. dimidiata*. The following reactions were recorded. In November 1957 pruritus and oedema appeared at the site of the lesion on the tibial malleolus. In March 1958 similar reactions were noted on the forearm, but this time rigors and urticaria ensued. In July 1958, after bites from 2 third-stage larvae, there was extensive urticaria and lymphangitis extending to the axilla. One month later, when he was bitten on the eyelid, oedema and swelling on both lids with systemic disturbance ensued, which lasted for 3 days.

In January 1959 this volunteer was bitten on the left wrist by 2 third-stage larvae of *T. dimidiata* and only a minor reaction resulted. On the same day a similar, but more severe, phenomenon resulted from the bite of 1 third-stage larva of *P. megistus*.

The Prausnitz-Küstner test was used for the presence of antibodies and their specificity, in an endeavour to show whether sensitivity to one reduviid species led to allergy from the bites of other members of this genus.

Serum from A was injected intradermally into C, who had no previous association with any reduviid. A number of sites were used on upper and forearms and 0·1 ml. of the serum injected in each. 2 days later one specimen each of *R. prolixus*, *T. infestans* and *P. megistus* was applied to these sites. Controls on the untreated skin were established. At the site of one *R. prolixus* bite an immediate and marked reaction resulted, but in others hardly any signs were recorded.

Volunteers B and C were repeatedly bitten on arm and leg by *R. prolixus* in order to sensitize themselves. Later the upper eyelid was offered, in order to bring it into connexion with Chagas's disease.

After subjecting himself repeatedly to *R. prolixus*, B was bitten in August 1958 by a fourth-stage larva of the species, on his left upper eyelid; an immediate reaction resulted. This experiment was repeated in the following month, on this occasion with an adult reduviid of this species, and he was bitten again on the right upper eyelid. On the third day the eye was closed and the swelling had spread to the nasolabial fold and the preauricular lymph gland was enlarged.

After a preliminary sensitization against *R. prolixus*, C was subjected to bites of *T. infestans* and somewhat similar events were recorded. In a table is drawn up a comparison between " ophthalmo-lymphonodular complex ", or Romaña's sign, characteristic of Chagas's disease, and the lid-oedema thus experimentally produced. The resulting phenomena are identical, except that in Chagas's disease they lasted longer. The periocular oedema is a definite allergic reaction to the saliva of the reduviid bugs, but in Chagas's disease it has hitherto been believed to be a reaction to *Trypanosoma cruzi*. Both reactions are clinically identical, only slight differences regarding time of reaction and manifestation are recorded. It is suggested that the immediate reaction caused by the triatomid may favour penetration by *T. cruzi* and its spread in the lymphatic system.

Philip Manson-Bahr

TORRES, C. M. & TAVARES, B. M. Miocardite no macaco *Cebus* após inoculações repetidas com *Schizotrypanum cruzi*. [**Myocarditis in** *Cebus* **Monkeys after Repeated Inoculations of** *Trypanosoma cruzi*] *Mem. Inst. Oswaldo Cruz*. 1958, June, v. 56, No. 1, 85–152, 43 figs. on 21 pls. (5 folding). [13 refs.] English summary.

One of the obscure points in the pathological anatomy of Chagas's disease is the pathogenesis of chronic myocarditis. Since it is thought that patients suffering from the chronic form of the disease in the State of Minas Gerais, Brazil, are subjected to repeated reinfections with *Trypanosoma cruzi*, transmitted by Triatomid bugs living in human dwellings, the authors carried out a series of experiments designed to throw light on this problem. For this purpose 7 *Cebus* monkeys were inoculated from one to nine times with 3 strains of *T. cruzi*, and autopsies were performed at periods from 35 to 252 days after infection.

The histopathological changes found in the heart were represented by diffuse interstitial myocarditis and lymphatic stasis. There was infiltration—in some cases with a perivascular distribution—by macrophages, plasma cells and lymphocytes, with minimal loss of cardiac muscle fibres, while leishmanial forms of *T. cruzi* were scanty in the myocardial muscles. Moreover, the diffuse myocarditis produced in the monkeys was not associated with the disseminated fibrosis characteristic of chronic human cases of Chagas's disease.

The myocardial changes produced in monkeys differed according to the intervals between inoculations: they were more marked when these were short, but only slight after long periods, suggesting that a previous inoculation conferred active immunity. *C. A. Hoare*

FEVERS OF THE TYPHUS GROUP

In this section abstracts are arranged as far as possible in the following order:—general; louse-borne typhus, flea-borne typhus, mite-borne typhus; rickettsialpox; tick-borne typhus; Q fever, other rickettsial diseases.

WEYER, F. Ätiologie und Epidemiologie der Rickettsiosen des Menschen. [**Aetiology and Epidemiology of Rickettsial Disease in Man**] *Ergebn. Mikrobiol. Immunitätsf.* 1959, v. 32, 73–160. [Numerous refs.]

This review by a leading authority of the rickettsial infections of man, covering some 60 pages, consists of 2 main parts of approximately equal length. The first is devoted to the rickettsiae, to their morphology, staining, cultivation and other biological properties. It is also in this portion of the article that the behaviour of these agents in experimental animals, including arthropods, is considered and that their classification is dealt with.

The epidemiology of these human rickettsial infections is the theme running through the second part, subdivision being into the 3 main groups; tick-borne, mite-borne and insect-borne.

There is a bibliography extending to 21 pages.

S. P. Bedson

GAMET, A. & MARTIN, J. P. Les rickettsioses au Cameroun, leur importance et la diversité de leurs aspects cliniques et sérologiques. [**The Importance of Rickettsial Infections in the Cameroons, and the Diversity of the Clinical and Serological Findings**] *Bull. Soc. Path. Exot.* 1958, Nov.–Dec., v. 51, No. 6, 949–60. [10 refs.]

The rickettsioses are widespread in the Cameroons and are a major factor in morbidity. This is especially the case in Yaoundé where, since the disappearance of malaria, they account for 30% of hospital cases.

The present paper is based on the discovery, during 3 months, of 50 patients with varying clinical phenomena in whom the diagnosis was made by microscopic serological agglutination of the rickettsiae. The clinical appearances were of influenza, boutonneuse fever, typhoid, or of inapparent, ocular and myalgic forms. Treatment was by chloramphenicol, 2 gm. daily for 10 days. In the typhoid-like group this treatment had to be reinforced sometimes with oxytetracycline.

The authors conclude that this work shows that rickettsioses may simulate a number of clinical conditions and points to the necessity of performing a rickettsial-agglutination test in every case.

Details of the 50 cases are tabulated. *Philip Manson-Bahr*

GUS'KOVA, V. A. **Concerning the Relative Increase in Recent Years of Second Attacks of Typhus.** *J. Microbiol., Epidemiol. & Immunobiol.* London. 1958, v. 29, No. 9, 1483–7. [26 refs.] [Translated from Russian.]

The incidence and severity of typhus have declined greatly in Russia but the proportion of second attacks has risen sharply from 3·6% in 1948–49 to 51·3% in 1954–55. The popular explanation of this was that infection persisted and later relapsed. A recent alternative suggestion, supported by the author, is reinfection after contact with inapparent or mild cases [PASTUKHOVA, this *Bulletin*, 1959, v. 56, 706, and SHATROV, *ibid.*, 932]. The author of this paper challenges the view that an attack of typhus confers a lasting immunity. He shows that in 1945–47 only 28% of typhus patients were over 30 years of age, but this proportion rose steadily to 87·5% in 1954–55. In the population aged over 40 years there are naturally more people who have had typhus than in those below that age, but recently there has been a two-fold absolute increase of second attacks in the older age-group. It is suggested that the previous low incidence of second attacks was due to the presence of a high degree of immunity which follows a first attack. The frequency of second attacks of typhus is tabulated, grouped according to the interval between attacks, from which it would appear that the recent increase in second attacks is partly due to a loss of specific immunity.

The author accepts the view that typhus is a meningo-encephalitis and that encephalitis of any aetiology leaves the patient more susceptible to illness, including typhus. Immunological and physiological reactivity decreases in the elderly, and where environmental conditions are improving this reactivity would not increase as much as in younger persons. The author's opinion is, thus, that elderly persons who have had typhus some decades previously not only lose their immunity and become more susceptible to disease because of typhus meningo-encephalitis, but they also have a lowered physiological

resistance to harmful influences in general in consequence of their low physiological reactivity. They are thus more vulnerable to typhus reinfection. [The argument is more complicated than this summary indicates. Those interested should read the paper.] *T. H. Davey*

ROGER, F. & ROGER, A. Sur la localisation initiale de *Rickettsia tsutsugamushi* au niveau des capillaires. [**Initial Location of** *Rickettsia tsutsugamushi* **in Relation to Capillaries**] *Bull. Soc. Path. Exot.* 1958, Nov.–Dec., v. 51, No. 6, 891–3.

In an attempt to determine the location of rickettsiae in vascular lesions, fragments of meningeal tissue from mice in the late stages of infection with *Rickettsia tsutsugamushi* were spread on slides, stained with Wright's stain and studied microscopically. Numerous rickettsiae were seen in the cytoplasm of macrophages lying immediately outside the capillary endothelium, none being detected in endothelial cells. The organisms were present in macrophages before the appearance of inflammatory reaction, suggesting that initial localization is adventitial rather than endothelial in character. *R. S. F. Hennessey*

JEU, Ming-Hwa. [**Studies on Tsutsugamushi Part 20. Morphology of the Nymph and Adult of Chigger Mite,** *Neoschöngastia gallinarum* **Hatori, 1920 (Acariformes, Trombiculidae).** *Acta Entomologica Sinica.*] 1959, Apr., v. 9, No. 2, 167–77, 16 figs. [10 refs.] [In Chinese.] English summary.

SHAPIRO, M. I. **Experimental Study of Strains of Tick-Borne Rickettsias isolated on one of the Islands off the South Coast.** *J. Microbiol., Epidemiol. & Immunobiol.* London. 1958, v. 29, No. 10, 1664–71, 3 figs. [12 refs.] [Translated from Russian.]

This paper describes tests on 5 strains of rickettsiae isolated from ticks and a rodent (the reed vole, *Microtus fortis*) on an island in southern Primor'e [E. Siberia] where rickettsiae resembling *Dermacentroxenus sibiricus* had previously been recovered from the ixodiid tick *Haemaphysalis concinna* [this *Bulletin*, 1959, v. 56, 523]. Human tick-borne typhus occurs on the island, and reed voles constituted 44·6% of 1,365 rodents collected in the endemic focus. The habitat of the reed vole generally coincides with that of *H. concinna*; the predominant ectoparasite on these animals in the summer (when typhus is most prevalent) is the gamasid mite *Hirstionyssus isabellinus*, which attacks man. The 5 new strains of rickettsiae were derived by inoculating guineapigs intraperitoneally with pooled material from *H. concinna* (3 strains), a mixture of the gamasid mites *Hirst. isabellinus* and *Haemolaelaps glasgowi* (1), and pooled brains and spleens from *Microtus fortis* (1).

Cross-immunization tests in guineapigs showed that all 5 strains of rickettsiae were identical and closely related to *D. sibiricus*. Guineapigs inoculated intraperitoneally had a benign febrile illness with scrotal reactions, their sera giving complement fixation with *D. sibiricus* antigen. The strains were adapted to mice by the intranasal route, producing pneumonia. In rabbits, a necrotic

skin reaction, iridocylitis or orchitis could be elicited by appropriate routes of inoculation.

It is considered that the strains represent a geographical variety of *D. sibiricus* [the organism responsible for North Asiatic tick-borne typhus].

R. S. F. Hennessey

HEISCH, R. B. & HARVEY, A. E. C. **Rickettsioses in Kenya: Serological Reactions of Wild Rodents and Inoculated Guinea Pigs.** *East African Med. J.* 1959, Feb., v. 36, No. 2, 116–18.

This paper summarizes results of complement-fixation tests for rickettsial antibodies carried out by J. H. S. GEAR in South Africa on sera from guinea-pigs inoculated with 7 strains of rickettsiae isolated in Kenya from ticks ("*H. leachii*", "*R. simus*", "*A. variegatum*" [presumably *Haemaphysalis leachi*, *Rhipicephalus simus* and *Amblyomma variegatum*]), rodents (*Arvicanthis* sp., *Otomys* sp., *Lemniscomys* sp.) and man. All 7 strains elicited antibodies reacting with antigens of *Rickettsia conori* var. *pijperi* and *R. akari*. Most sera had higher titres against *R. conori* than against *R. akari*, the exceptions being the strain from "*A. variegatum*" (the same titre against both antigens) and the human strain (titres higher against *R. akari*).

Complement-fixing antibodies for *R. conori* and *R. akari* were present in the sera of wild rodents (*Arvicanthis abyssinicus*, *Otomys angoniensis*, *Rattus natalensis*, *Tatera nigricauda* and *Xerus rutilus*); 33 out of 229 sera from these species reacted with *R. conori*, 37 with *R. akari*, 6 with *R. prowazeki* and 7 with *R. mooseri*. 17 out of 89 sera from *Tatera nigricauda* collected in the Rift Valley reacted with *R. akari*, suggesting that this gerbil may be a reservoir of rickettsialpox.

The results show that the rickettsiae of tick typhus in East and South Africa are closely related and that the reservoir in East Africa may be a complex of rodents.

R. S. F. Hennessey

WOJCIECHOWSKI, E. **The Problem of Q Fever in Poland.** *Bull. Inst. Marine Med. Gdańsk.* 1959, v. 10, Nos. 1/2, 39–47. [19 refs.]

Extensive serological surveys during the period 1951–58 yielded no evidence that Q fever was endemic or enzootic in Poland. The incidence of positive reactions was about 0·2% in more than 4,000 human sera (including 249 from patients suspected of having atypical pneumonia) and lay between zero and 2·5% in large samples of sera from cattle and sheep in various localities.

An outbreak of Q fever which affected 63 people working at or living near a sheep-breeding farm in Rzeszów province in 1956 was traced to a flock of imported Rumanian sheep. Control measures included slaughter of the infected flock. No new cases in man or animals have since been detected in the area.

During the epidemic at the sheep farm, wool samples were taken from the infected flock by workers of the Institute of Zootechnics at Cracow. 2 of these persons contracted Q fever and 14 other employees of the Institute and 5 laundry workers were subsequently affected.

A third localized outbreak of Q fever involved 17 workers in the State Institute of Hygiene in Warsaw in 1957. The source appears to have been the

Rickettsia Laboratory, where animals had been infected experimentally with *Rickettsia burneti*; no cases occurred among the Rickettsia Laboratory staff, who had been vaccinated against Q fever a year previously.

It is concluded that further studies are necessary to determine whether natural foci of infection exist in Poland but that meanwhile frontier quarantines for imported animals should be organized. *R. S. F. Hennessey*

DERRICK, E. H., POPE, J. H. & SMITH, D. J. W. **Outbreaks of "Q" Fever in Queensland associated with Sheep.** *Med. J. Australia.* 1959, May 2, v. 1, No. 18, 585–91, 3 figs.

Q fever in Queensland has mainly affected persons in contact with cattle (*e.g.* abattoir workers and dairy farmers), but outbreaks occurred on a sheep station and at a fellmongery in 1958. Out of 34 men assembled to make up a shearing team on the sheep station, 15 contracted an illness diagnosed as Q fever (13 confirmed serologically) within a period of 33 days, the first signs of illness occurring about 11 days after shearing started. The weather was hot and dry during 30 days of shearing, 24,708 sheep being shorn. One member of the permanent staff (8 men) was also affected; this man had occasionally entered the shearing shed and helped in the work. Agglutinins for *Rickettsia burneti* were found in 20 (11%) of 174 sera from sheep on the station. The sera of 2 out of 13 cows and 1 out of 11 calves which had been brought into the shearing zone contained complement-fixing antibodies for *R. burneti*; the animals with positive sera did not arrive until at least 10 patients had been infected, and it seemed unlikely that cattle had a part in the origin of the human outbreak. Attempts to isolate *R. burneti* from wool, dust and ticks were unsuccessful. The serum of 1 out of 5 kangaroos collected on the station contained complement-fixing antibodies for *R. burneti*.

As a result of enquiries stimulated by this outbreak, records of 20 cases of Q fever which occurred in Western Queensland since January 1955 were obtained. All the patients were males, 16 being persons associated occupationally with sheep.

The outbreak at a fellmongery (in Brisbane) occurred between March and May 1958, 10 men being affected. Sheepskins are thought to have been the source of infection.

It is concluded that Q fever is widely endemic in Western Queensland, cases having been reported from 12 localities; as elsewhere, sheep can be a source of human infection. *R. S. F. Hennessey*

AVERY, R. J., MOYNIHAN, I. W., TAILYOUR, J. M. & RICE, C. E. **Q Fever: a Survey to determine if *Coxiella burneti* is Present in Cattle in British Columbia.** *Canadian J. Comp. Med.* 1959, May, v. 23, No. 5, 173–4.

"Samples of raw milk from 30 herds on Vancouver Island, B.C. and 122 farms from Hope, B.C. east to Sheep Creek, B.C. close to Canadian-United States border were injected into guinea pigs by the intraperitoneal route. In no case was the causative agent of Q fever, *C. burneti*, detected as judged by thermal reactions in inoculated guinea pigs and complement-fixation tests on their sera." [See this *Bulletin*, 1956, v. 53, 175.]

Bool, P. H. **Studies on** *Ehrlichia canis* **(syn.** *Rickettsia canis***).** *Acta Tropica.* Basle. 1959, v. 16, No. 2, 97–107, 7 figs. (5 coloured on pl.) [34 refs.]

YELLOW FEVER

In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, transmission, pathology, diagnosis, clinical findings, treatment, control.

Groot, H., Kerr, J. A., Sanmartin, C. & Vidales, H. **Antibodies to Yellow Fever and other Arthropod-Borne Viruses in Human Residents of San Vicente de Chucuri, Santander, Colombia.** *Amer. J. Trop. Med. & Hyg.* 1959, Mar., v. 8, No. 2, Pt. 1, 175–89, 1 fig.

This in the first phase of a long-term study of jungle yellow fever in an area where 78 cases were diagnosed between 1936 and 1957. Two areas were studied: (1) the Foothills, comprising narrow steep-sided valleys 500–1000 m. above sea level, covered with tropical rain forest but extensively cleared for cocoa and coffee growing; (2) the Valley Bottom, an area of rain forest and swamp 150–500 m. above sea level, sloping down to the Magdalena River.

Monkeys were rare or absent in the Foothills but widely distributed in the Valley Bottom. 56 of the yellow fever cases came from the Foothills and 12 from the Valley Bottom. There were periods of 2–3 years without the occurrence of cases in the area. Repeated large-scale yellow fever vaccination campaigns have failed to stop sporadic cases. Venezuelan equine encephalomyelitis virus has been isolated twice from the blood of febrile human patients in the Valley Bottom.

1,189 sera were collected from the Foothills and 96 from the Valley Bottom. They were tested undiluted by an intracerebral neutralization test in mice against at least 50 LD50 of virus. The viruses used were yellow fever (French neurotropic), dengue (Trinidad 1751), Ilhéus (Laemmert), Venezuelan equine encephalomyelitis (Kubes), St. Louis, eastern equine encephalomyelitis, and Bunyamwera. Fresh normal serum was added only to the tests with Ilhéus, and sera were only inactivated before the tests with dengue. 91 sera were also tested by the haemagglutinin-inhibition test against some of the viruses.

About three-quarters of the sera from both areas had yellow fever neutralizing antibody: similar incidences were found in both sexes and at all ages as would be expected if they were due to yellow fever vaccination programmes. Good correlation was found between the presence of neutralizing antibody against French neurotropic, and that of haemagglutinin-inhibiting antibody against 17D yellow fever virus.

Dengue antibody was commoner in the Valley Bottom (10%) than in the Foothills (3%). Ilhéus antibody showed a similar difference: 15% in the Valley Bottom and 3·4% in the Foothills. A known vector of Ilhéus, *Psorophora ferox*, is more abundant in the Valley Bottom than in the Foothills. 6% and 8% of sera from the 2 areas had St. Louis antibody. The haemagglutinin-inhibition tests indicated that there was greater activity of the

Group B arborviruses in the Valley Bottom than in the Foothills—probably mainly yellow fever and Ilhéus viruses.

The incidence of antibody to Venezuelan equine virus was much higher in the Valley Bottom (34%) than in the Foothills (2%). A high incidence was also found in monkeys shot in the Valley Bottom. 2 sera had haemagglutinin-inhibiting antibody to Mayaro virus but not to Venezuelan virus: and 1 had a high titre against Mayaro and a low titre against Venezuelan virus. The sera with antibody to western equine virus had higher titres against Venezuelan virus, probably owing to cross-reactions. A few sera with Bunyamwera antibody were found. *C. E. Gordon Smith*

MEERS, P. D. **Smallpox—17D Vaccine.** [Correspondence.] *Trans. Roy. Soc. Trop. Med. & Hyg.* 1959, May, v. 53, No. 3, 296.

The author has recently observed fortuitously the protective effect of peptone on the 17D strain of yellow fever virus during centrifugal freeze-drying [this *Bulletin*, 1959, v. 56, 820] and has investigated this further.

A batch of vaccine pulp was prepared with the addition of only half of the usual volume of water and was divided into 5 aliquots. To each was added an equal volume of buffered distilled water or of peptone solution (Evans) in buffered distilled water (*p*H 7·4), so that the final concentrations of peptone in the pulp aliquots were as shown in the table below. The mixtures were placed in ampoules in quantities of 1 ml. of pulp per ampoule. After routine freeze-drying, 6 ampoules from each of the 5 classes were titrated, with the following results:

Concentration of peptone, %, in vaccine pulp as ampouled	0	1·25	2·5	5·0	10·0
Average titre of the rehydrated desiccated material, LD50/ampoule	1,370 x 10^3	2,340 x 10^3	2,010 x 10^3	1,970 x 10^3	786 x 10^3

The relative failure of protection at the higher concentration of peptone may have been due to the glutinous nature of the rehydrated product before dilutions for titration were made and this was especially marked at the 10% and rather less at the 5% concentrations. This would probably have influenced the efficacy of dispersal of the virus in solution, and therefore the titre. No extreme means of dispersal were used, since they would not apply in a vaccine for field use.

The results indicate that a final peptone concentration of 1·25% in the pulp in ampoules gives a satisfactory degree of protection during desiccation. Because of wide differences noted between different brands of peptone (as shown in work with dried smallpox vaccine) the use of Messrs. Evans's peptone is stressed by the author. *H. J. O'D. Burke-Gaffney*

RABIES

SCHMID, A. W. Estudos sôbre a mortalidade por várias causas no município de São Paulo. I. Raiva. [**Studies on Mortality from Various Causes in the Municipality of Sao Paulo, Brazil. I. Rabies**] *Rev. Inst. Med. Trop. São Paulo.* 1959, May–June, v. 1, No. 1, 3–10, 4 graphs. [10 refs.]

The English summary appended to the paper is as follows:—

"This paper is a continuation of the author's M.D. thesis, as well as the first of a series on data about the mortality by a number of diseases in the municipality of São Paulo. These data may be useful to sanitarians and clinicians, who will get information concerning the importance of given diseases as cause of deaths, as well as on groups of population most affected by them. Their control will thus be made easier.

"Hydrophobia presented a low mortality rate in the municipality of São Paulo from 1894 to 1957, but there is a slight tendency of coefficients to increase. The male sex coefficient was three times higher than the female one in the period ranging from 1948 to 1957. Mortality was greater in children than in other age groups. Comparison of white, yellow and mulatto plus negro groups showed mortality to be almost the same in all races during those 10 years.

"This same period presented but little monthly variations in human deaths by hydrophobia. On the contrary, August presented a higher number of sick animals, in accordance with the popular belief about the seasonal distribution of the disease. As it is, there is need to study larger samples in order to get more consistent results as to the monthly distribution of hydrophobia in men and animals in our environments.

"Although the mortality rate of hydrophobia is low in this municipality, the existence of human cases justifies a program of eradication of this disease, as has already been done in several countries."

ATANASIU, P. & LÉPINE, P., with the technical collaboration of C. LAURENT, M. COLLOMBIER & G. BENSE. Multiplication du virus rabique des rues sur la tumeur épendymaire de la souris en culture de tissus. Effet cytolytique. [**Multiplication of Rabies Street Virus in Mouse Ependymoma in Tissue Culture. Cytolytic Effect**] *Ann. Inst. Pasteur.* 1959, Jan., v. 96, No. 1, 72–8, 1 text fig. & 6 figs. on pl. [22 refs.]

A strain of rabies virus isolated in Paris in 1957 from a patient has been adapted to passage in tissue cultures of a line of mouse ependymoma cells (*J. Immunol.*, 1955, v. 75, 134). In the first passage virus appeared in the supernatant fluid after 14 days and attained a titre of $10^{3.5}$; stained preparations made after 27 days showed cell degeneration, with cytoplasmic inclusions surrounded by a halo. Negri bodies were found in mice inoculated with culture fluid. The virus was carried through 22 passages; the titre of virus in the culture fluid remained at 10^2–10^3 and a cytopathic effect appeared regularly after 4–5 days. The virus was neutralized in tissue culture by horse and human specific antisera.

D. J. Bauer

NICOLAU, C. S., FUHRER, B., GÎRD, E. & IONESCU, N. I. Asupra migrării in organism a vaccinului antirabic "argintat" studiat cu ajutorul Ag^{110}. **[Migration in the Host Organs of "Metallized" Antirabic Vaccine, studied by means of ^{110}Ag]** *Studii si Cercetări Inframicrobiol.* 1959, v. 10, No. 1, 95–106, 5 figs. [13 refs.] French summary.

The following is a translation of the authors' summary:—

The authors sought to follow the migration in the organs of "metallized" antirabic vaccine prepared with the radio-active isotope ^{110}Ag.

A 1/5 suspension of rabid brain in a 0·15% solution of $^{110}Ag\ NO_3$ was inoculated in a dose of 2 ml. into the thigh muscles of a rabbit at different intervals. Estimations of radioactivity carried out in organs removed from killed rabbits gave the following results.

Fixed rabies virus, although attenuated, behaved like a living virus: it moved in an ascending direction by the nerve trunk route (sciatic). The migration of the virus in the tissues which it immunized took place both in a centripetal and centrifugal direction.

These results confirm the concept of tissue immunity in virus diseases.

H. J. O'D. Burke-Gaffney

VILLEMOT, J. M. & PROVOST, A. Étude sur l'antigène soluble du virus rabique. **[Studies on Rabies Virus Soluble Antigen]** *Ann. Inst. Pasteur.* 1959, June, v. 96, No. 6, 712–22, 1 fig. [22 refs.]

"The precipitation reaction of rabies virus in gel medium shows two lines of precipitation.

"Kipps *et al.* have demonstrated in the brain of suckling mice infected with rabies virus the presence of a soluble antigen. It seems probable that the two lines of precipitation correspond to two distinct soluble antigenic fractions: one (the smallest particle) is thermostable, induces the formation of complement-fixing antibodies; the other (the largest particle) is thermolabile and induces the formation of neutralizing antibodies.

"The fact that the complement-fixing antigen appears after the formation of the virulent particle suggests that the soluble antigen is neither a precursor nor a template for the virus.

"A different molecular arrangement of the two antigenic fractions would account for their immunologic and physico-chemical properties."

BELL, J. F. **Transmission of Rabies to Laboratory Animals by Bite of a Naturally Infected Bat.** *Science.* 1959, May 29, v. 129, 1490–91.

Evidence of transmission of rabies by the bites of insectivorous bats had, until now, rested on the very rare occurrence of such infection in human beings. The present report records infection in white mice resulting from the bite of a naturally-infected little brown bat. This bat (*Myotis californicus californicus*), which on 21 September 1958 had attacked an elk hunter in western Montana, was captured on the same day and brought for examination to the laboratory at Hamilton. There, during its 7-day period of survival after capture, it was induced to bite 3 of a litter of 6 2-day-old mice, the 3

unbitten sucklings being retained in the same litter to serve as controls. On the 13th day after being bitten 2 mice, and on the 14th day a third mouse, showed partial paralysis of the hindquarters and their brains were removed for transmission experiments; of the other 3 mice all remained normal throughout a 28-day observation period.

When it appeared from these results that an infectious agent was present in the bitten mice, brain tissue and salivary glands of the bat were triturated separately in albumin-saline diluent and injected intracerebrally, in 0·02 ml. volumes of 5–10% suspensions, into 21-day-old white mice. Salivary gland suspension was also injected intramuscularly. Of 6 mice injected intracerebrally with brain suspensions 4 became ill on the 10th day after injection, 1 on the 11th day and 1 on the 12th. None of the mice injected with salivary gland suspension showed signs of illness during a 28-day period of observation, but in a further transmission experiment, in which the same suspension was injected intracerebrally into a litter of 5 2-day-old mice, 1 of the sucklings became ill on the 14th day and was killed. In the words of the author, "a transmissible agent was demonstrated in tissues of mice injected with tissues from, or bitten by, the bat. These tissues included brain of mice infected by biting or by injection of salivary glands and brain, and salivary glands of mice infected by biting". Proof of the identity of the transmissible agent as rabies virus was established by the results obtained from application of the serum-virus neutralization test. Further investigations showed that mice immunized with HEP Flury strain virus were immune to intracerebral injection of the bat isolates and that, on histological examination, the brain of a mouse which had been bitten by the bat contained numerous Negri bodies.

These findings, together with the occurrence of human rabies after bat bite, establish the infectiousness of bites of insectivorous species. It has yet to be demonstrated, however, that insectivorous bats can become true carriers of infection—that is, infective but symptom-free.

[As regards human rabies from the bites of non-haematophagous bat species, a case reported by DEAN *et al.* on 15 Dec., 1958, in the *Veterinary Public Health Newsletter*, Communicable Disease Centre, U.S. Public Health Service, Atlanta. Ga., was in a 53-year-old woman, who died of confirmed rabies 2 months after having been bitten by a rabid silver-haired bat (*Lasionycteris noctivagans*). This case from California is the first in which the biting species was observed and reported and the bat was available for diagnosis and proved positive in laboratory tests. 2 previous deaths in the United States (both from Texas), attributed to exposure to rabid insectivorous bats, had been reported on anamnestic and epidemiological bases.] *G. Stuart*

SILBERSTEIN, W. Ergebnisse und Probleme der Tollwutbekämpfung in Israel in den Jahren 1948–1958. [**Results and Problems of Rabies Control in Israel in 1948–1958**] *Zent. f. Bakt.* I. Abt. Orig. 1959, v. 174, Nos. 5/6, 431–9. [16 refs.]

Rabies in Israel is an important public health and economic problem as in some other countries, and in this paper there is an account of experience of the disease in the decade 1948–58 following the foundation of the State of Israel. Dogs are the most important danger to man since in the last 30 years they have represented 70% of all ascertained rabid animals. The dog population has been estimated at between 100,000 and 150,000 but only a relatively

small proportion of these is domestic. Jackals, which do not recognize international boundaries, are the most important reservoir of the virus. Rabies occurs in other wild animals and recently it was proved to exist in an ichneumon.

A table sets out the numbers of different animals in which rabies was found in individual years from 1948–58 and the total of these ranged from 10 in 1951 to 282 in 1955. Epizootics occurred in 1949 and 1954–57. In 1949 the number of infected animals was 219:—dogs (101), jackals (39), cats (10), cattle (23), goats (6), donkeys (10), camels (29) and 1 fox. For 1955 the figures of infected animals were: dogs (198), jackals (16), cats (2), cattle (46), sheep (16), horses (2) and donkeys (2).

The problem of prevention of human rabies lies in the large numbers of people who report bites from animals although the total of actual cases is not large. During the period of the British Mandate 1921–47, the number of registered deaths was 104 but in 1948–58 the rabies deaths numbered 23, which occurred among 50,714 persons who had been bitten by animals. Of these persons 11,512 were given the full course of 14 prophylactic injections of a modified phenolized Semple vaccine prepared at the state laboratory in Jerusalem. It is noted that 5 of the patients who died of rabies had received the full course of injections but in the remainder there appears to have been either none or only an incomplete number of injections.

The importance of immediate local treatment of bites is stressed.

In the years 1952–6 there were 17 complications during the course of prophylactic treatment—5 cases of allergic reaction, 6 of myeloradiculitis and 6 cases of encephalomyelitis of which 2 were fatal.

There is a description of the control measures which are in use in Israel and these consist mainly in the immunization of domestic dogs and the destruction of wild dogs, jackals and cats. *M. E. Delafield*

Nicolau, S. S., Mîrza, L., Athanasiu, P. & Petrescu, A. Cu ajutorul metodei reflexelor condiţionate se poate preciza limita viabilităţii virusului rabic în vaccinurile antirabice formolate? [**Can the Viability Limit of Rabies Virus in Formolized Antirabies Vaccines be determined by means of the Conditioned Reflexes?**] *Studii si Cercetări Inframicrobiol.* 1959, v. 10, No. 1, 7–18, 10 figs. [21 refs.] French summary.

The following is a translation of the authors' summary:—

The authors studied the action of a series of antirabies vaccines containing concentrations of formol between 0·8% and 0·05% on the conditioned reflexes elaborated by rats. After vaccination, disturbances of the activity of the higher nervous system were seen in some of the animals and these were manifested by prolonged latent periods, by inhibition of the positive conditioned reflex and by accentuation of the inhibition of differentiation. The modifications which occurred appeared in the group of animals injected with vaccine containing 0·4% formalin and became intensified in subsequent groups where the formol concentration of the vaccine fell to 0·2%, 0·1% and 0·05%. Vaccines containing 0·6% and 0·8% formol were inert in respect of alimentary motor conditioned reflexes. Non-inoculated rats used for controls for the reflexes and those receiving normal homologous protein containing 0·8% or

0·05% formol, did not show any modifications of activity of the higher nervous system. *H. J. O'D. Burke-Gaffney*

MÖBEST, H. Prüfung des Tollwut-Impfstoffes nach Hempt im Habel-Test. **[Control of Hempt Rabies Vaccine by the Habel Test]** *Zent. f. Bakt.* I. Abt. Orig. 1958, v. 173, Nos. 5/6, 345–51.

The antigenicity of 10 batches of rabies vaccine of Hempt type was investigated by means of the Habel test. Protection indices ranging from 0·8 to 3·8 log units were observed. The material had been stored for 86–395 days since preparation, but no definite relationship between potency and time of storage could be observed. In a similar examination of 10 batches of Semple vaccine the protection indices ranged from 2·3 to 4·7 log units. The effect of variation in the challenge virus on the value of the protection index was also investigated; the Pitman-Moore strain generally gave low values, whereas both low and high values were observed after challenge with the CVS strain. *D. J. Bauer*

MÖBEST, H. Über die unterschiedliche Anaphylaxiewirkung bei Kaninchen, die mit Semple bzw. Hempt-Impfstoff vorbehandelt sind. **[Differences in Anaphylactic Action in Rabbits given Preliminary Treatment with Semple and Hempt Vaccines]** *Arch. f. Hyg. u. Bakt.* 1958, Dec., v. 142, No. 8, 575–80.

An investigation has been made of the anaphylactic effects produced in rabbits by repeated injections of inactivated rabies vaccines of Semple and Hempt type. A rabbit was sensitized by the intradermal injection of 0·2 cc. of Semple vaccine; the intravenous injection of 0·2 cc. of the same vaccine carried out 12 days later produced immediate fatal anaphylactic shock. The same result was obtained with a control preparation which contained no virus. In similar experiments with Hempt vaccine intravenous injections carried out 13, 20 and 25 days after the intradermal injection did not produce anaphylactic shock. It was considered that the ether extraction carried out during the preparation of the Hempt vaccine was responsible for the removal of the sensitizing agent. *D. J. Bauer*

PLAGUE

In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, rodent hosts, transmission, pathology, diagnosis, clinical findings, treatment, control.

HAAS, V. H. **When Bubonic Plague came to Chinatown.** *Amer. J. Trop. Med. & Hyg.* 1959, Mar., v. 8, No. 2, Pt. 1, 141–7.

On March 5, 1900, Chick Gin, a Chinese in San Francisco, by dying achieved a place in history as the first recognized indigenous case of plague in North America. A fascinating account of the social and administrative upheaval that followed and persisted for 4 years is given in this paper. At

first the case was thought to be an isolated one, though concealment by the Chinese was suspected, but by the end of the month 4 unconnected cases had been discovered and the chief quarantine officer regarded the disease as epidemic and took action. The inhabitants of Chinatown objected to the police cordon round them and the attempts to clean up the very insanitary state of their area, while the remainder of San Francisco, fearing serious commercial repercussions from the unpleasant publicity, obstinately maintained that there was no epidemic.

All the moves and counter-moves in the prolonged battle are described. The protagonists were, on the one hand, the Surgeon General of the Marine Hospital Service, and ultimately the Secretary of the Treasury, and the President himself, and on the other hand the State Governor and the State Board of Health, aided by the press and the local citizens. The battle did not end until an independent Commission proved the presence of plague, the surrounding States ordered stringent quarantine restrictions against California, and finally the recalcitrant Governor retired and was succeeded by a more cooperative one.

The story is told in a very readable and interesting way. *T. H. Davey*

SMITH, J. L. & HIGUCHI, K. **Studies on the Nutrition and Physiology of** *Pasteurella pestis*. **IV. Utilization of Peptides during the Growth of** *Pasteurella pestis*. *J. Bacteriology*. 1959, May, v. 77, No. 5, 604–8, 3 figs. [22 refs.]

"The utilization of certain peptides for growth of *Pasteurella pestis* has been studied. Of the dipeptides tested which contained the essential amino acids methionine or phenylalanine, it appeared that only peptides of L-amino acids were utilized. DL-Peptides supported only one half of the growth obtained with the L-isomers.

"Glycyl dipeptides of alanine and of phenylalanine were apparently less available to the organism than the corresponding dipeptides with the glycine moiety in the terminal carboxyl position.

"Diglycine and triglycine were more stimulatory for rapid growth of *P. pestis* than free glycine.

"With the limited number of compounds tested, the growth of *P. pestis* was not enhanced by supplying amino acids (except glycine as diglycine or triglycine) in peptide form."

BUNDEALI, Amina, HABBU, M. K. & DELIWALA, C. V. **Curative Value of Sulphamethoxypyridazine in Experimental Plague Infection in Mice.** *Indian J. Med. Sci.* 1959, May, v. 13, No. 5, 423–6, 1 graph.

"Sulphamethoxypyridazine did not show any superior curative action as compared to sulphadiazine in experimental plague infection in mice. On the other hand, sulphadiazine is superior as it has a lower toxicity when given orally as reported by Neipp and Meyer."

CHOLERA

In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, pathology, diagnosis, clinical findings, treatment, control.

BISWAS, S. **On a Method of Evaluation of Epidemic Indices relating to Cholera.** *Indian J. Pub. Health.* 1957, July, v. 1, No. 3, 182–6, 196.

An analysis was made of the mortality rates from cholera in 19 subdivisions of West Bengal in the 390 weeks from January 1949 to June 1956. For each area the weekly rates were arranged in a two-way table, with 8 rows for the years and 52 columns for the weeks, so that the columns showed the mortality in corresponding weeks of each calendar year. If there were no secular trend and no epidemic the entries in each column should follow a Poisson distribution. On this basis the author identified *outlying observations*, *i.e.* rates which were too large to have occurred by chance (95% probability). By examining each week in turn he was able to recognize *epidemic patches* in which consecutive weeks of one year had unduly high mortality. For the 19 areas he tabulates (1) the number of separate epidemic patches in the study period, (2) their average duration and (3) their average maximum weekly mortality rate.

Some areas, *e.g.* Darjeeling, had few epidemic patches and they were short and of low intensity ; this is explained by its low population density and relative isolation. Calcutta, on the other hand, showed by this technique frequent epidemic patches of long duration and high intensity.

[The method of identifying *outlying observations* is somewhat similar to that of PEARSON and CHANDRA SEKAR, *Biometrika*, 1936, v. 28, 308, but differs in some respects which are not fully justified by the author.] *J. Knowelden*

SCHRAMM, G. & MOHR, Elisabeth. **Purification of Neuraminidase from** *Vibrio cholerae.* [Correspondence.] *Nature.* 1959, June 13, v. 183, 1677–8.

DE, S. N. **Enterotoxicity of Bacteria-Free Culture-Filtrate of** *Vibrio cholerae.* [Correspondence.] *Nature.* 1959, May 30, v. 183, 1533–4.

Most readers will be familiar with the experiments of the author and his colleagues in which various bacterial preparations are injected into isolated loops of rabbit small intestine [this *Bulletin*, 1954, v. 51, 581 ; *Bull. Hyg.*, 1957, v. 32, 279]. It was concluded that the dilated loops containing blood-stained exudates and the lesions seen in the mucous membrane were toxic manifestations or evidence of the pathogenicity of the test material injected, since the control fluids, uninoculated culture media etc., resulted in collapsed intestinal loops with no evidence of oedema or exudate. Various bacterial suspensions, *Vibrio cholerae* and *Escherichia coli*, were used for these experiments.

Dr. De now reports similar findings with bacteria-free culture-filtrates of stock strains of proved non-haemolytic Inaba and Ogawa cholera vibrios. The results may be a little more striking but they do not differ fundamentally from those reported previously by the author and his colleagues ; the effect never appeared to be a manifestation of infection but to be due rather to some

substance produced, under optimum conditions, by the organism. It is very doubtful whether cholera vibrios produce a true exotoxin; the toxicity of dead vibrios for laboratory animals has long been known: indeed De and his colleagues in previous experiments obtained some positive "loop tests" with washed killed vibrios. SINGER *et al.* [this *Bulletin*, 1949, v. 46, 37] quote BURNET as having grown cholera vibrios on semi-solid agar and obtained a substance which had a necrotic effect on the mucous membrane of the small intestine of the guineapig. This substance was neutralized by an antibacterial serum and it appeared to be identical with the O antigens. It seems doubtful therefore whether the enterotoxic effects observed with these bacteria-free culture-filtrates of cholera vibrios are in fact due to a specific soluble exotoxin.

[The observations recorded in this note and the previous papers with which the author was concerned are of considerable interest.] *H. J. Bensted*

AMOEBIASIS AND INTESTINAL PROTOZOAL INFECTIONS

In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, pathology, diagnosis, clinical findings, treatment, control.

JEVTIC, M. [**Comparative Diagnosis of Intestinal Amoebae**] *Bull. Inst. Hyg.* Belgrade. 1958, v. 7, No. 1, 1–7. [In Serbian.] English summary.

In the investigation of 226 stool samples for the presence of intestinal amoebae positive results were obtained by the microscopical examination of saline suspensions in 73 instances (32·3%) and by the examination of cultures prepared from the stools in 81 instances (35·8%). When the preparations were subsequently stained and the structure of the nucleus was made visible it was necessary to amend the original diagnosis of *Entamoeba histolytica* to *E. coli* in 32 of 61 instances (52·5%). In a further investigation of 1,039 stool samples carried out by examination of the nuclear structure, *E. histolytica* was found in only 91 (8·7%) instances, and the author suggests that the apparently high incidence of carriers of *E. histolytica* reported in Serbia is due to the use of unreliable diagnostic methods. *D. J. Bauer*

ATHANASIADOU, Maria & DAIKOS, G. K. **A New Phenanthroline-Quinone for the Treatment of Amoebiasis.** *J. Trop. Med. & Hyg.* 1959, June, v. 62, No. 6, 135–7.

"A new phenanthroline-quinone derivative, code number 11925 ('Endobex', Ciba) was tried in 26 cases of chronic amoebic colitis, in oral doses of 300 mg. daily. The effects were satisfactory. In all patients the stools became negative within 3–4 days and the clinical picture improved rapidly. Side effects were negligible in only two cases, consisting of mild transient dizziness which did not necessitate an interruption of therapy."

BESSEIGE, H., RIGAUD, J. L. & TRAPET, P. **Some Considerations on Asiatic Amebiasis, regarding the Use of a Dichloroacetamide Derivative.** Reprinted from *Gaz. Sanitaria.* Milan. 1959, v. 8, Nos. 1/2, 6 pp.

Mebinol [N-(beta-oxyethyl)-N-(p-phenoxy-(4′ nitro)-benzyl)-dichloroacetamide] was used in the treatment of 15 patients in Viet-Nam. 9 of these patients were passing vegetative *Entamoeba histolytica* in the stools at the time of the treatment; the other 6 were not, but they gave "a previous amebic history" and were suffering from "colitis". All the patients were given 6 Mebinol tablets (each tablet 250 mgm.) daily by mouth for 10 days.

The stools of the 9 patients positive for *E. histolytica* became free from parasites within 3 to 5 days and their symptoms were relieved; the stools of 4 of these patients who were re-examined up to 3 to 4 months after the treatment were still parasite-free. In all these 9, therefore, the immediate result of Mebinol treatment was considered to be good; and in those who were watched for a time the benefit lasted. The other 6 patients, in whose stools *E. histolytica* was not present, did not benefit from the Mebinol treatment; and the drug did not seem to have any action on concurrent conditions such as *Giardia* infections. *A. R. D. Adams*

VOUILLOUX, P., M'BETTE, H. & M'BONGUE. Hepatites inflammatoires et amibiase hepatique. [**Inflammatory Hepatitis and Hepatic Amoebiasis**] *Méd. Trop.* Marseilles. 1959, Mar.–Apr., v. 19, No. 2, 205–11. [17 refs.]

Acute inflammatory disorders of the liver in the tropics are commonly ascribed to amoebiasis, particularly as many patients give a history of previous dysentery. In Douala these acute liver conditions are at least as frequent as they are elsewhere in the tropics; but people in the Cameroons are not afflicted with amoebiasis to the same extent as are those in many other parts of the tropical world. Not more than one-third to one-half of the acute liver conditions encountered in the Cameroons can directly be attributed to amoebiasis.

Although treatment with chloroquine gives remarkably good results in the control of these acute inflammatory liver conditions, this is not necessarily due to its anti-amoebic action within the liver; it gives equally good results in patients in whom an amoebic origin of the hepatitis can be dismissed. Emetine, and the broad spectrum antibiotics, are very much less effective in these cases than is chloroquine.

The source of many of these acute inflammatory liver conditions therefore is in doubt at the present time; the authors offer some theories to explain their origin. *A. R. D. Adams*

BIAGI F., F. & NAVARRETE, F. Busqueda de amibas en abscesos hepaticos. [**Search for Amoebae in Hepatic Abscesses**] *Rev. Latinoamericana Microbiol.* Mexico. 1958, Sept. 30, v. 1, No. 3, 243–8.

The English summary appended to the paper is as follows:—

"Investigation of amoebae was performed by direct and culture methods using 64 samples of necrotic material and 50 samples from the wall of 79 cases of abscesses of the liver considered of amoebic aetiology.

"*E. histolytica* was found in 68% of the cases, with the same frequency in the necrotic material as that from the wall of the abscess; this frequency appeared to be higher when more samples were studied. The direct method is satisfactory. The culture method doesn't appear to be too useful in the samples of necrotic material; however, in the samples of the wall of the abscess, amoebae may be demonstrated when the direct method fails and it also facilitates identification of the parasite and permits isolation of strains. The antiamoebic treatment reduces or eliminates the possibility of finding amoebae."

Cook-Sup So. Die Behandlung des Amöben-Leberabszesses. Erfahrungen, einschliesslich der Therapie anderer nicht intestinaler Formen der Amoebiasis mit Resotren. [**The Treatment of Amoebic Liver Abscess**] *Deut. med. Woch.* 1959, May 1, v. 84, No. 18, 871–4, 896. [27 refs.]

The English summary appended to the paper is as follows:—

"Fifteen cases of extra-intestinal amoebiasis, 11 of them with liver abscesses, are reported. Treatment consisted of high doses of 'Resochin' (chloroquine diphosphate) and/or 'Resotren' (chloroquine diphosphate chiniofon), the latter drug also injected in a soluble form into the liver abscess, where present. All patients with liver abscess, one with skin abscess, and one with a pleural abscess were cured. However, two patients with extra-intestinal amoebiasis died, one of cachexia, the other of circulatory collapse, before a full course of chemotherapy had been completed."

Mussini, M. & Tomat, E. Sulla patogenicità della *Giardia* o *Lamblia intestinalis*. [**The Pathogenicity of** *Giardia intestinalis*] *Giorn. di Malattie Infettive e Parassit.* 1959, May, v. 11, No. 5, 366–70, 3 figs. [Numerous refs.]

A review.

Mussini, M. & Tomat, E. La terapia delle affezioni da *Giardia intestinalis*. [**Treatment of Infection with** *G. intestinalis*] *Giorn. di Malattie Infettive e Parassit.* 1959, May, v. 11, No. 5, 354–9. [Numerous refs.]

A review.

YAWS AND OTHER TREPONEMATOSES

Van Zanen, G. E. **Bone Yaws. Report on a Case.** *Trop. & Geograph. Med.* Amsterdam. 1958, Dec., v. 10, No. 4, 354–62, 7 figs.

A boy aged 5½ years in the Vogelkop Peninsula, Netherlands New Guinea, was admitted to hospital with swollen tender limbs, hands and feet, but with no yaws skin lesions. He had been treated (8 × 150 mgm. neoarsphenamine) at the age of 8 months for generalized yaws. When admitted to hospital

he was ill-nourished, with splenomegaly and malarial parasitaemia. Radiographs showed gross changes in hand and forearm, foot and leg bones. Immediate response to arsenic followed by PAM was good. 8 months later most of the lesions had disappeared and the appearance of the bones had returned to nearly normal except for some slight cortical thickening. The author suggests that the hand and foot lesions resembled those of the early (secondary) stage, while the lesions of the leg and forearm bones more closely resembled those of the late (tertiary) stage. The terminal phalanges and the carpal bones were also involved. He suggests that reinfection may have played an important part in the type and severity of the lesions present.

[The nearly complete resolution of the lesions following treatment strongly suggests that all the lesions were of the early stage. The reproductions of the radiographs are interesting. Although reinfection may be more frequent than at present realized, there is little evidence in favour of it and some against it.]

C. J. Hackett

RELVICH, A. L. **Yaws as a Factor in the Causation of the Contractures of Fingers among the Population of West Africa.** *West African Med. J.* 1959, Apr., v. 8 (n.s.), No. 2, 78–80.

Brief case notes are given of 10 patients aged 10–40 years with contractures of the fingers, who received PAM, 1·2 mega units (adults) or 0·6 mega units (children). 2 of the patients also had palmar hyperkeratosis. In all patients the contractures decreased during the second month after treatment; this was more marked in the younger patients. The author says that these results support the view that yaws might be the origin of these contractures.

[See also this *Bulletin*, 1957, v. 54, 1417. No serological studies were made.]

C. J. Hackett

BENDEL, E. G. H. **A Yaws Mass Campaign in Liberia; Organization and some Preliminary Results.** [Miscellanea.] *Acta Tropica.* Basle. 1959, v. 16, No. 1, 69–75.

After a brief description of the country and its people, the author discusses the common diseases, among which gonorrhoea and granuloma inguinale are prevalent, but syphilis exists only in a small group of the population where yaws is absent. Before the nation-wide campaign, yaws had been endemic throughout the Republic, with clinical prevalences of 24–48% to 6–11% in different parts. Total mass treatment was carried out in accordance with the recommendations of WHO.

Among the many aspects of successful mass campaigns discussed are proper headquarters, recruitment, technical and administrative training and supervision of staff, and the need to develop self-confidence in staff. It is important to adapt the work of the team to the customs and beliefs of the people in different parts of the country. It is essential to know the size of the population being examined, so as to ensure that a high percentage is examined. The success of such a campaign can be assessed by two results, (1) decrease in yaws, and (2) the development of a responsible and reliable local staff able to continue the work after international staff are discontinued.

In 3 tables are given data for 3 districts, which might be summarized as follows:

District		Estimated population	Population examined	Total Yaws diagnosed	Infectious Yaws
Gbarnga	ITS	58,500	64,562	31,427 (48·6%)	1,617 (2·5%)
	RS	58,428	65,318	2,346 (3·6%)	98 (0·15%)
Sanniquellie	ITS	82,953	90,727	24,171 (26·6%)	1,813 (2·0%)
	RS	86,124	100,159	1,821 (1·8%)	123 (0·12%)
Tappita	ITS	23,850	25,720	7,526 (29·3%)	480 (1·87%)
	RS	24,544	31,453	347 (1·10%)	45 (0·14%)

ITS = Initial Treatment Surveys, made during 1955.
RS = First Resurveys, made 12 months later.

At the Initial Treatment Survey, about 4–5% of yaws patients had papillomata and 75–80% had hyperkeratoses. At resurveys there were no important changes in the proportional percentage prevalences of different types of yaws lesions, since great reductions occurred in all.

[At Initial Treatment Survey, when total mass treatment was carried out, all patients with active disease received 1·2 mega units PAM for adults, and 0·6 mega units PAM for children, and the rest of the population received half these doses as latent cases and contacts. At Resurveys, active yaws cases received the same treatment and immediate contacts received half doses; these contacts were 3–5 times as many as the active cases.]

[This successful campaign is now completing its second Resurvey and preparations have been made for continued surveillance to be carried out from developing rural health centres.] *C. J. Hackett*

LEPROSY

In this section abstracts are arranged as far as possible in the following order:—epidemiology, aetiology, pathology, diagnosis, clinical findings, treatment, control.

SCHALLER, K. F. Zur Epidemiologie der Lepra in Äthiopien. [**The Epidemiology of Leprosy in Ethiopia**] *Ztschr. f. Tropenmed. u. Parasit.* Stuttgart. 1959, Apr., v. 10, No. 1, 79–94, 3 figs. [19 refs.]

Leprosy appears to be widespread in Ethiopia and the number of reported cases has rapidly increased since 1954 when the situation was taken in hand.

In this land the belief is still widely held that leprosy is a hereditary God-sent disease, and it is therefore regarded without fear or apprehension. This report is the result of 5 years' study. The number of persons suffering from this disease in Ethiopia is estimated to be above 200,000, or 1·5% of the population.

The highest incidence is in the central region, in the provinces of Begemdir, Wollo, Shoa and Gojiam, where it is at its highest at altitudes of 6,000 feet or more and where 49 persons per 1,000 are affected. The average for this area is assessed at 15 per 1,000. Surveys of schoolchildren have proved particularly valuable—approximately one-fifth of these are in the infective stage. A comparison made with Chaussinand's figures from Saigon shows a comparable similarity in that the highest incidence of primary lesions occurs in the feet—24·87% compared with 26·12% in the Princess Zenebe Work Hospital (out of 483). The age of the patients showing first stigmata of infection was investigated; there is an increase from the age-group 10–14 (15·5%) to that of 20–39 (51·5%) and then a gradual decline to the age-group 60–79 (0·25%), computed from 4,000 cases. There are no essential differences between sexes. Although the child index is relatively high, that of the lepromatous and borderline cases is relatively low.

To initiate an effective control of a country such as Ethiopia numerous centres for ambulatory treatment will have to be established. A policy of compulsory isolation under present conditions will have to be rejected.

Philip Manson-Bahr

MONTESTRUC, E., GARCIN, D., BERDONNEAU, R., BENOIST, J. & CHABANNES, J. La lèpre à la Martinique en 1958. **[Leprosy in Martinique during 1958]** *Arch. Inst. Pasteur de la Martinique.* 1959, Jan., v. 12, Special No., 63–78.

During 1958 various medical examinations brought to light 122 new leprosy patients of whom 14·7% were lepromatous, 43% tuberculoid, 39·1% indeterminate, and 2·6% borderline. This is in contrast to the previous year (1957) when the types had shown 25·8% lepromatous, 26·7% tuberculoid, and 47·3% indeterminate. There is thus a sign that the open infectious type of the disease is diminishing definitely for the first time in the 25 years since the campaign against leprosy began.

The authors used the methods adopted at the Tokyo Congress whereby patients are classified according to type, sex, domicile and profession, and compared the data for the last 5 years. The results of treatment with cycloserine and thioamid of isonicotinic acid are described; these drugs, though higher in price, were found to have no advantage over DDS, which has so far given the most satisfactory treatment.

The authors are encouraged by (1) the comparative diminution of new lepromatous cases, (2) the diminution of new patients of less than 20 years of age, (3) the fact that 92% of open cases are now in hospital, as compared with only 38% 5 years ago, (4) the large number of those under careful treatment who have become negative, and (5) by the results of supervision of leprosy foci and the use of BCG as a prophylactic. On the other hand they are dissatisfied with the means taken for finding out new cases, with the lack of care of patients having long-standing disease, with the number of contacts

with patients who escape supervision and the failure of especially the more advanced patients to cooperate regarding spread of infection. However, 1958 may be regarded as the favourable turning point in the campaign against leprosy. *Ernest Muir*

South Pacific Commission. Noumea, New Caledonia. **Trends in Leprosy in the Pacific. An Account of the Introduction and Spread of Leprosy in the Pacific, and of its Importance in Pacific Health.** [Lonie, D. A.] [Thesis.] *Technical Information Circular No. 32.* 1959, Feb., pp. ii + 33, 1 map on pl. [Numerous refs.]

A map is given showing the area concerned, about 7,000 miles in length from NW to SE. The islands are divided into Polynesia, Micronesia and Melanesia. The idea of the thesis is to produce a dynamic picture of the disease with regard to its importance as a public health problem. Leprosy is supposed first to have been introduced by Chinese immigrant labour, and then spread by islanders travelling from island to island, though it might take 25 years after introduction into an island before assuming epidemic form. The various rates (prevalence, lepromatous, age and racial) are commented on. There are no significant differences in the prevalence rates between the Polynesians and other Pacific racial groups (though apparently the disease is worse among Europeans), or if there is it is overshadowed by the far larger differences between islands.

Standards of living and sanitation are low and are believed to be potent factors in spreading the disease, but raising these standards is an immense task and can be regarded as a control measure only on a long-term basis.

The chief difficulty in treatment consists in providing adequate supervision in dispensaries. For example, in New Guinea, of 2,272 registered patients only 166 are receiving out-patient treatment. *Ernest Muir*

Price, R. B., with the technical assistance of R. Iosefa. **Relapse of Leprosy in American Samoa.** *Amer. J. Trop. Med. & Hyg.* 1959, May, v. 8, No. 3, 358–63.

American Samoa has a population of 20,154 of whom 86% live on Tutuila Island. Leprosy is said to have spread from Western Samoa in the second decade of this century. Until 1943 only 10 cases had been diagnosed, but an average of 7 new cases a year were diagnosed for the next 13 years. In 1953 the incidence was calculated at 2·4 per thousand, but this was found to have risen to 5·3 in 1958 after a survey had been made.

Of the 81 patients at present in American Samoa there were familial contacts of parents or siblings except in 2 where the contact was the spouse.

Until 1953 leprosy patients were generally sent to Makogai in Fiji, but after that a 30-bed leprosy hospital was built in Tutuila and American Samoans were repatriated.

There had been a clinical and histological relapse in 25% of discharged patients, and 41·7% were still bacteriologically positive, indicating that the criteria for discharge had not been sufficiently strict, or that there had not been

sufficient follow-up of discharged patients. Among tuberculoid patients there had been a much lower relapse rate. *Ernest Muir*

QUAGLIATO, R. & VEITIEKA, J. Revisão dos focos de lepra. Cadastro lepromínico e exames de comunicantes pelo sistema de convocação–viabilidade–rendimento–aspecto econõmico. [**Survey of Leprosy Foci. Registration of Lepromin Results and Examination of Leprosy Contacts by Invitation and Visiting, the Results obtained and the Economic Aspects**] *Rev. Brasileira Leprologia.* S. Paulo. 1958, July–Dec., v. 26, Nos. 3/4, 273–93, 1 graph. [26 refs.] English summary.

The methods used in examining persons in contact with known leprosy patients for leprosy are discussed. Invitations were sent out but, though there was a good response in some places, only about one-third turned up as a rule. Of these about 1·8% were found to have leprosy. Public Health visitors found it very difficult to make home examinations. It was calculated that on an average the finding of each new leprosy patient cost about 6,600 cruzeiros [at the current official rate of about 52 cruzeiros to £1, that is over £125]. The lepromin reaction was read in 60% of cases, 50% of these giving positive results. *Ernest Muir*

FUKUDA, M. [**Contribution to the Study of the Lepromin Reaction, Rescrutinizing of the Method and the Time for Reading of the Late Reaction**] *Lepro.* 1958, May, v. 27, No. 3, 248–62, 6 figs. on pl. [26 refs.] [In Japanese.] English summary.

In reading the delayed lepromin reaction the author applies two criteria: (1) the diameter of the spot lesion (the red spot which appears in the skin at the site of injection), (2) the diameter of the nodular infiltration at the site. He used two antigens, those of Mitsuda and Dharmendra. He tested 185 leprosy patients and used as non-leprous controls 25 adults and 1,227 children.

He found that in lepromatous patients the red spot area practically corresponded with the area of infiltration, whereas in the non-leprous controls the red spot area tended to be larger, and was especially so in 39 who were suffering from tuberculosis. He found that it was possible to measure the size of the reaction more accurately and objectively by using the red spot method.

The diameter of the reaction can be used in the classification of types, those of more than 7 mm. being classed as positive.

The spot reading gave the largest measurement from the 8th to the 15th day, and the infiltration reading from the 15th to the 29th day. Repeated readings from the 8th day onwards are recommended.

In non-lepromatous leprosy the histological picture of the spot lesion area was similar to that of the infiltration area and of tuberculoid structure. "Similar findings were observed in the positive reaction site of the lepromatous cases." [Apparently, according to the seventh Table, positive late reactions with Mitsuda antigen occurred in up to 81 out of 139 lepromatous patients. This requires explanation in the light of the findings of most authorities that the late lepromin reaction is seldom positive in lepromatous leprosy.]

Ernest Muir

Brown, J. A. K. & Stone, M. M. **A Depot Lepromin Test and BCG Vaccination.** *Lancet.* 1959, June 20, 1260–62, 4 figs. [11 refs.]

The history of the lepromin test is briefly described. On account of the increasing difficulty in obtaining from patients material for producing the antigen, it is necessary to economize. The authors find that a 1 in 100 antigen may be used when the Heaf multipuncture apparatus is substituted for the usual intradermal route, thus effecting considerable economy. It was also found that in weakly reacting subjects, and in infants born of leprous mothers who were at first negative, the multipuncture method furnished a depot which continued long enough to act as an indicator when BCG (injected at the time of reading the multipuncture results) converted the lepromin reaction to positive.

It is found that depot lepromin is easier to make, and by using the multipuncture method is easier to administer. "The tremendous economy in material—especially if the number of tests can be reduced from two to one—will make it possible to examine the children and contacts of patients so as to identify those most likely to develop the disease. This should open the way to further investigations of the value of B.C.G. vaccination in protecting children against leprosy." *Ernest Muir*

De Almeida, J. O. Preparo, padronização e comparação de antígenos em reações quantitativas de fixação de complemento com soros de doentes de lepra. [**Preparation, Standardization and Comparison of Antigens in Quantitative Complement-Fixation Reactions with Sera of Leprosy Patients**] *Rev. Brasileira Leprologia.* S. Paulo. 1958, July–Dec., v. 26, Nos. 3/4, 181–271, 25 graphs. [Numerous refs.]

The English summary appended to the paper is as follows:—

"Water-soluble and pyridine-soluble antigens have been studied by the isofixation method.

"Several preparations from each strain of tubercle bacillus have been found to have satisfactory properties for use as antigen in complement fixation reactions for leprosy. Antigens have been compared with one another by the method of isofixation curves. When two preparations tested with the same leprous serum give the same curve, it is assumed that the two have essentially the same specific reactivity. The several antigen preparations tested have given nearly identical curves. From these curves the antigen dose to be used in the test was determined.

"Titers were computed as the slope of regression lines between complement and antigen or between complement and serum, for antigen or serum titrations. Quantitative relationships between serum and complement were found in the presence of a parallel dose of antigen, defined as the dose of antigen that does not disturb the relative parallelism of the isofixation curves in the zone where complement fixation is proportional to the amount of antibody present.

"Suitable complement-fixation test-systems adapted to sequential analysis of the data are described for leprosy sera and antigen prepared from tubercle bacilli.

"Tests for comparability of specific reactivity of antigen preparations were made with a number of lepromatous sera, each used in a pair of tests with a

reference-standard antigen in one and the test antigen in the other. In these tests more convenient preliminary procedures were employed; and in evaluation of the test result, the author used the grade of specific reactivity defined as G = log T − 0·568 for leprosy system, in reactions with six units of complement; G is obtained from a table. This permits determination of admissibility and of classification as defective or not by use of a very simple arithmetic procedure.

"The method results in great saving of effort and materials in experimental procedures and in processing the data without any consequent delay or loss of confidence in the ultimate decisions for acceptance or rejection of antigen preparations."

PHAM KIM LUONG, TRAN VAN BANG & NGUYEN DINH TIEP. Essai de traitement des maux perforants plantaires hanséniens par des implantations placentaires. [**Attempts at Treatment of Leprous Plantar Perforating Ulcers with Implantations of Placenta**] *Bull. Soc. Path. Exot.* 1958, Nov.–Dec., v. 51, No. 6, 881–4, 1 fig. on pl.

The effect of extract of placenta in promoting cicatrization in general led the authors to test what effect the implanting of small cubes of fresh primipara placenta would have on the healing of perforating ulcers. The implants were kept for 8 days in normal saline containing penicillin and streptomycin at zero temperature so as to give time for biological stimulants to develop. A graft of about 1 cubic centimetre size was inserted under the skin of the abdomen in the left iliac fossa.

Out of 50 patients treated there were very favourable results in 6%, favourable results in 66%, and no improvement in 28%. Short case histories of some of the patients are given. *Ernest Muir*

DINIZ, O. Profilaxia da lepra no Brasil. Plano atual da campanha e sua execução. [**Prophylaxis of Leprosy in Brazil; The Present Plan of Campaign and its Execution**] *Rev. Brasileira Leprologia.* S. Paulo. 1958, July–Dec., v. 26, Nos. 3/4, 141–53, 1 graph.

The history is given of the campaign against leprosy in Brazil since the formation of the *Sociedade Paulista de Leprologia* and its journal. Then there is given in tabular form the numbers of cases registered each year since 1946, a figure which rose from 3,813 in the first year to 7,068 in the year 1957. In 1946 the number per 100,000 was 8·04, and in 1957 11·93. However, during this period the percentage of lepromatous cases dropped from 62·3 to 51·4. Particulars are given of the numbers of cases discovered by re-examination of persons in contact with known patients. The numbers of registered patients in each of 22 states is given, varying from 21,005 in São Paulo to 36 in Alagôas. A striking feature is the sudden increase in indeterminate cases in 1956–7.

Ernest Muir

MOTTA, C. M. de P. Proxilaxia da lepra na Amazônia. Relatório da "Commissão especial" designada pelo Diretor do Serviço Nacional de Lepra. [**Prophylaxis of Leprosy in Amazonia; An Account of the Special Commission Appointed by the Director of the National Leprosy Service**] *Bol. Serviço Nac. de Lepra.* Rio de Janeiro. 1958, Dec., v. 17, No. 4, 344–73, 2 charts.

De Souza-Araujo, H. C. Murídeo hipersensivel ao bacilo de Stefansky. [**Mice Hypersensitive to Stefansky's Bacillus**] *Bol. Soc. Cubana de Dermat. y Sifil.* 1958, Sept.–Dec., v. 15, Nos. 3/4, 149–51.

After describing previous experiments in which he had inoculated mice with *Myco. leprae-murium* and with cultures of acid-fast bacilli, the author gives details of his use of an American race of black mice.

6 young animals of this breed were each inoculated with 0·2 cc. of a fresh suspension of leproma taken from a white rat. On the 6th day after inoculation there were inguinal tumours varying in size from as small as a grain of rice to as large as a kidney bean. On the 7th day 3 of the animals were killed and material taken for histological examination. In 2 of these the preparation showed granuloma resembling the appearance in rat leprosy.

The author considers that the speed with which these pathological changes took place indicates that this breed of animals is particularly susceptible to rat leprosy, and that they should be used for experiments with human leprosy.

Ernest Muir

HELMINTHIASIS

In this section abstracts are arranged as far as possible in the following order:—Trematodes (*schistosomes, other flukes*); Cestodes (*Diphyllobothrium, Taenia, Echinococcus, other cestodes*); Nematodes (*Hookworms, Ascaris, Filarial worms, Dracunculus, etc., Trichuris, Enterobius, Trichinella, etc.*).

Biagi F., F., Gómez Orozco, L. & Robledo, Efigenia. Ensayo sobre la ditiazanina como droga antiparasitaria. [**Trial of Dithiazanine as an Antiparasitic Drug**] Reprinted from *Bol. Med. Hosp. Infantil.* Mexico. 1959, Feb., v. 16, 17–21. English summary (5 lines).

The authors in Mexico have used dithiazanine [this *Bulletin*, 1958, v. 55, 1262; 1959, v. 56, 752] in the treatment of 120 patients suffering from different helminthic infections. The dosage used was 10 mgm./kgm. orally each day for 5 days (initially 20 mgm./kgm. was used, but this dose frequently caused vomiting and so it was abandoned). In adults a dose of 600 mgm. daily was not exceeded. The effect of the drug was assessed by 3 egg counts on each specimen: the stool examinations were made by Ferreira's method which the authors find gives more accurate results than many other techniques. Most of the patients were children. Altogether 169 treatments were given as 85 patients had a single course, 26 patients had 2 courses, 5 had 3, 3 had 4 and one had 5 courses of treatment.

The results are shown in a table. In trichuriasis, the egg counts were reduced by 70% in 57% of cases. The efficacy was thus less than that found by earlier workers, and this the authors attribute to the greater accuracy of the Ferreira technique.

In strongyloidiasis, usually so refractory to treatment, the efficacy was very high. Egg counts were reduced by 100% in 84·2% of cases and by more than 80% in all.

In ascariasis the counts were reduced by 80% or more in 55% of cases. The drug was not satisfactory in 13 cases of hookworm and 12 of *Hymenolepis* infection. *H. J. O'D. Burke-Gaffney*

McCullough, F. S. **The Susceptibility and Resistance of** *Bulinus* (*Physopsis*) *globosus* **and** *Bulinus* (*Bulinus*) *truncatus rohlfsi* **to Two Strains of** *Schistosoma haematobium* **in Ghana.** *Bull. World Health Organization.* Geneva. 1959, v. 20, No. 1, 75–85, 2 figs. [19 refs.]

In experiments designed to compare the susceptibility of two distinct and geographically separated species of *Bulinus* occurring in Ghana, *B.* (*B.*) *truncatus rohlfsi* and *B.* (*P.*) *globosus* were exposed each to their local strains of *Schistosoma haematobium* and to the strain pertaining to the other. In all 4 experiments the conditions for exposure were closely identical except that in the first two the snails were exposed to 200 miracidia each while in the other two experiments the number of miracidia was increased to 2,000. At the 200-miracidia level each species proved susceptible to its local strain of *S. haematobium* but refractory to the alternative strain. At the 2,000-miracidia level resistance to the alternative strain was apparent but not quite complete. Both levels of exposure are considered to be much higher than those obtaining in nature and it is concluded that under field conditions both species can transmit with regularity only that strain of *S. haematobium* with which they are fully compatible.

Determination of the length-breadth ratio of large numbers of eggs of each of the *S. haematobium* strains failed to show any significant morphological differences. The author suggests that further work on morphological comparison should be carried out on the cercariae of these local strains.

O. D. Standen

Gelfand, M., Alves, W. & Woods, R. W. **The Frequency of Schistosomal Ovideposition in the Heart.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1959, May, v. 53, No. 3, 282–4.

There are a few references in the literature to the finding of schistosome ova in the myocardium [this *Bulletin*, 1936, v. 33, 96; 1956, v. 53, 1012; 1958, v. 55, 541.

The present authors, in Southern Rhodesia, examined portions of myocardium about ½ inch square from each auricle and ventricle of 30 adult African males at autopsy. The subjects had signs of the disease in the bladder, and portions of bladder and rectum were also examined. The specimens were digested with 10% caustic potash and the centrifuged deposits examined after several days' digestion. Probably most of the patients had contracted the disease in childhood as they all came from endemic areas.

In all 30 bladders, *S. haematobium* ova were found and in 16 patients *S. mansoni* ova were found in the rectal wall. No ova could be found in any specimens from auricles and ventricles.

The study seems to suggest that the heart is an unusual site for the development of schistosome ova and that lesions large enough to cause congestive heart failure must be extremely rare. It would be impossible to diagnose schistosomal myocarditis during life. Schistosomiasis may be included in the

list of cardiomyopathies in the tropics (as subendomyocardial fibrosis is), but it is so rare that it may be wiser not to consider it seriously until further cases are recorded. *H. J. O'D. Burke-Gaffney*

STIREWALT, M. A. **Isolation and Characterization of Deposits of Secretion from the Acetabular Gland Complex of Cercariae of** *Schistosoma mansoni. Exper. Parasit.* New York. 1959, June, v. 8, No. 3, 199–214, 6 figs. [14 refs.]

CHERNIN, E. & SCHORK, Ann R. **Growth in Axenic Culture of the Snail,** *Australorbis glabratus. Amer. J. Hyg.* 1959, Mar., v. 69, No. 2, 146–60, 4 figs. [21 refs.]

MARILL, F. G. Richesse en oeufs des pontes de *Planorbis glabratus,* en Guadeloupe au cours de la saison sèche. [**Richness in Eggs of Batches Laid by** *Australorbis glabratus* **in Guadeloupe during the Dry Season**] *Bull. Soc. Path. Exot.* 1958, Nov.–Dec., v. 51, No. 6, 903–8.

OLIVER-GONZALEZ, J. & HERNANDEZ MORALES, F. El diagnóstico serológico de la esquistosomiasis. Consideraciones sobre investigaciones recientes. [**Recent Investigations on the Serological Diagnosis of Schistosomiasis**] *Bol. Asoc. Med. de Puerto Rico.* 1959, Feb., v. 51, No. 2, 41–6. [22 refs.]

A review and discussion.

NATIONAL SCHISTOSOMIASIS RESEARCH COMMITTEE. **Studies on Schistosomiasis japonica in New China.** *Chinese Med. J.* Peking. 1959, Apr. & May, v. 78, Nos. 4 & 5, 368–79 ; 461–89.

This is a useful and adequately detailed compilation prepared by the Chinese National Schistosomiasis Committee in testimony to the initiative and energy of the Chinese Communist Party in this field of national health during the years since 1951. It correlates studies published by Chinese workers on most aspects of *Schistosoma japonicum* infection in China ; nearly all these studies are readily available in the literature ; some of them are of considerable originality and importance. No bibliography is given in this compilation, but the information contained therein on epidemiology, methods of spread and of carriage of the parasite, its reservoir hosts, and the pathology, diagnosis, treatment and control of *S. japonicum* infection in China is both comprehensive and well presented. Set out in this form, it affords a very useful guide to the schistosomiasis situation in the territory under consideration as seen by those actively concerned with the problems of the disease. *A. R. D. Adams*

WAGNER, E. D. & CHI, Lois W. **Species crossing in** *Oncomelania. Amer. J. Trop. Med. & Hyg.* 1959, Mar., v. 8, No. 2, Pt. 1, 195–8.

Laboratory-bred specimens of the four species of *Oncomelania, viz.*: *O. nosophora, O. formosana, O. quadrasi* and *O. hupensis,* were interbred by

mating pairs of snails for each species combination. Reciprocal crossings of the sexes of each species combination were also made. Hybrid young were obtained from each of the 12 combinations and were found to be fertile. These F_1 hybrids were mated to produce an F_2 generation in all species combinations but not always with each reciprocal cross. Crossings involving *O. formosana* were generally the most successful while those of *O. nosophora* were rather poor.

The evidence that fertile hybrids can be produced by crossing these species brings the taxonomic separation of the genus *Oncomelania* into 4 species into some doubt, but the authors incline to the view that for practical purposes the present nomenclature should stand. *O. D. Standen*

VON HARNACK, G. A. Bandwurmbehandlung im Kindesalter mit Cestodin. [**The Treatment of Tapeworm Infections in Children with Cestodin**] *Deut. med. Woch.* 1959, May 1, v. 84, No. 18, 865–6, 896.

The author's aim is to show the efficacy and lack of toxicity of the tin preparation Cestodin (composed of metallic tin, tin oxide and tin chloride) in the treatment of tapeworm infections, especially in children. Although HIRTE [this *Bulletin*, 1951, v. 48, 1134], KUHLS [*ibid.*, 1954, v. 51, 195] and THIELE (*Landarzt*, 1957, v. 33, 584) treated 238 patients with Cestodin and obtained 91·2% of successful results, tin preparations have not been adopted in all textbooks of child health. Cestodin, unlike male fern and acridines, is practically non-toxic, though occasionally slight nausea, a sense of pressure in the stomach, colic and rarely vomiting have been reported.

For these reasons the author has used Cestodin since 1950. He has treated a total of 31 children with it, most of whom were infected with *Taenia saginata*, though there have been isolated infections with *Taenia solium*. Many of the children had had earlier unsuccessful treatment, chiefly with Filmaron (a preparation of male fern). All the patients treated with Cestodin tolerated the drug well without serious side-effects. Appetite remained unaltered. Only 1 child vomited a small amount on the second and third day of the treatment, but the treatment was continued and on the fourth and fifth day the child was perfectly well. Transient colic occurred in 3 other children, but this had been complained of during earlier treatments and could not therefore be attributed to Cestodin.

Of the 31 children treated 28 were seen one-half to 3 years later and in only 1 was it not possible to follow up the results of treatment. After one course of treatment 25 out of 27 patients were cured; in 2 a second course was necessary and after this the patients were permanently free of the infection. These results correspond with those obtained in adults.

The patients were dosed according to the rules prescribed by the makers of the drug. The doses were: children over 12 years, 1 tablet a day for 3 days; children 8 to 12 years old, 1 tablet a day for 2 days; children under 8 years, half a tablet a day for 2 days. The tablets were given after meals, but the effects of the tin were more marked if it was given before eating. These doses seem, in comparison with the adult dose of 3 tablets a day, to be relatively high, especially for young children, but the dose must be regulated according to the size and weight of the host and also to the size of the worms.

The results obtained indicate that a 5-day treatment is enough. The tapeworm chains come away in 2 to 4 days. If they are still being passed out on the fifth day, the treatment can be continued without hesitation for 2 more days. An increase of the dose by 50% can be tolerated.

The day before treatment began and on the fifth day a saline purge was given, but this was omitted in some cases without affecting the result. Cestodin can, the author thinks, be given to ambulant patients, provided that the parents see that it is given regularly and that they keep the children under careful observation. The results of the treatment cannot be adjudged until 3 months after the treatment, because, in spite of rigorous search, the heads of the worms were not found, but if segments of the worm do not appear 2 to 4 months after treatment, it can be assumed that the treatment has been successful. *G. Lapage*

SCHILLER, E. L. **Experimental Studies on Morphological Variation in the Cestode Genus Hymenolepis. II. Growth, Development and Reproduction of the Strobilate Phase of *H. nana* in Different Mammalian Host Species.** *Exper. Parasit.* New York. 1959, June, v. 8, No. 3, 215–35, 5 figs. [10 refs.]

AGOSIN, M. & ARAVENA, Luisa. **Studies on the Metabolism of *Echinococcus granulosus*. III. Glycolysis, with special reference to Hexokinases and Related Glycolytic Enzymes.** *Biochim. et Biophys. Acta.* 1959, July, v. 34, No. 1, 90–102, 7 figs. [47 refs.]

HUANG, Wen-Hsien, KAO, Chih-Tien, HSU, Mei-Chuan & HUANG, Chen-Chi. **Observations on Hookworm Disease among Coal Miners in Taiwan. II. A Pre-Treatment Survey of Intestinal Parasite Infections in the Workers of Coal Mines: especially of the Intensity of Hookworm Infection.** *J. Formosan Med. Ass.* 1958, Nov. 28, v. 57, No. 11, 731–5. [Fuller version in Chinese 710–30. (15 refs.).]

This survey reports the incidence of protozoan and helminthic infections in coal miners in Taiwan, particularly hookworm, *Ascaris*, and *Trichuris* infections. A single faecal specimen from each of 1,317 workers in 4 coal mines was examined by qualitative and quantitative techniques. The results showed a low incidence of protozoal infections in miners, much lower than in farmers, and also lower helminth infection rates except for hookworm. Surface workers in the mines showed higher infection rates with both protozoa and helminths than underground workers, except for the hookworm incidence which was 87% in the latter. 26% of 991 hookworm ova counts were very light infections (under 400 ova per gm. of faeces), 62% were light, 11·5% were moderate and 0·8% were severe (10,000 or more ova per gm.). This low intensity of infection is attributed to voluntary change of occupation by heavily infected miners. Both species of human hookworm infected most of the miners, and the mean egg count represented a worm load of 6 female *Ancylostoma duodenale* or 33 female *Necator americanus*. Comparison between surface and underground

workers, and male and female underground workers revealed no great differences, nor did a comparison with miners who also farmed in market gardens.

Ascaris infection rates for underground, surface, and office workers were respectively 35%, 44%, and 29%, and only 1·5% were heavily infected. The mean egg count represented a worm load of 5 adult worms.

Trichuris infection rates were 33%, 39%, and 36% respectively in underground, surface and office workers, and none was heavily infected.

[For Part I, see this *Bulletin*, 1958, v. 55, 918.] *T. H. Davey*

MAGAUDDA-BORZI, L. & PENNISI, L. Sul valore della reazione di deviazione del complemento nella diagnostica di laboratorio dell'anchilostomiasi. [**The Value of the Complement-Fixation Test in the Laboratory Diagnosis of Ankylostomiasis**] *Riv. Italiana d'Igiene*. 1958, Nov.–Dec., v. 18, Nos. 11/12, 489–94. [14 refs.] English summary (5 lines).

The authors point out that the possibility that there may be some immunity in ankylostomiasis has not been investigated to any great extent, one of the problems being to obtain a suitably specific antigen. They have taken up this problem, using an antigen prepared from adult *Ancylostoma duodenale* from human faeces, and give the method of preparing it.

The test itself was carried out by Kolmer's method on 48 patients (35 female and 13 male) aged between 5 and 60+ years who were known to be infected; there were 20 uninfected controls. Of these 48 patients, 40 were found to be positive, 3 doubtful, and 5 negative. 2 of the 20 controls were positive.

The authors suggest that the results encourage further study (1) to perfect the antigen; (2) to ascertain the relation between the results and the course of the disease in the individual patient, either through the influence of the more or less chronic state of the patient or the influence of treatment. They emphasize that preparation of a suitable antigen is by no means easy but it would be facilitated if culture of adult *A. duodenale* "*in vitro*" were successful.

W. K. Dunscombe

See also p. 1054, HUANG & TUNG, **The Effect of Vitamin B Complex on Hematopoiesis. III. Studies with a Small Group of Anemic Children.**

ATIAS, A., HERMOSILLA, M. & ALESSANDRINI, H. Ascaridiasis peritoneal. Descriptión de tres casos. [**Peritoneal Ascariasis. A Report of 3 Cases**] *Bol. Chileno de Parasit.* 1959, Jan.–Mar., v. 14, No. 1, 13–15. [10 refs.] English summary (4 lines).

LINDGREN, I. & LINDGREN, A. G. H. **Creeping Eruption.** *Nordisk Med.* 1959, May 28, v. 61, No. 22, 828–9, 2 figs.

The English summary appended to the paper is as follows:—

"A case of creeping eruption acquired by bathing in Liberia is reported. The parasite was found by histological examination of an excised piece of skin. A short survey is given of the aetiology of the disease and its therapeutic problems."

MARSH, C. L. & KELLEY, G. W., Jr. **Studies in Helminth Enzymology. II. Properties of an Inorganic Pyrophosphatase from** *Ascaridia galli*, **a Nematode Parasite of Chickens.** *Exper. Parasit.* New York. 1959, June, v. 8, No. 3, 274–85, 7 figs. [16 refs.]

LIN, Liang-Ch'eng, CH'EN, Kuei-Kuang & LIN, Yuan-Ch'üan. **Fluorosis in Endemic Areas of Filariasis in Foochow.** *Chinese Med. J.* Peking. 1959, May, v. 78, No. 5, 446–8.

Lin and Ch'en [this *Bulletin*, 1958, v. 55, 1031] investigated the possible association of chronic fluorosis with severity of *Wuchereria bancrofti* infection, reaching the conclusion that there is no connexion between the two. This paper describes additional work confirming that conclusion. In 34 filariasis patients from a fluorosis area at Foochow, there was no correlation between the numbers of microfilariae found in 60 cmm. blood samples and 24-hour urinary excretion of fluorides. *B. B. Waddy*

See also p. 1068, LU *et al.* [**The Blood Preference of some Culicine Mosquitoes in Rural Areas of Nanking**]

See also p. 1061, DANARAJ *et al.*, **The Serological Diagnosis of Eosinophilic Lung (Tropical Eosinophilia) and its Etiological Implications.**

GONZALES-MUGABURU, L. Hallazgo de *Mansonella ozzardi* en la Selva peruana. Nota preliminar. [**Detection of** *Mansonella ozzardi* **in the Peruvian Jungle**] *Rev. Med. Exper.* Lima. 1958, Dec., v. 12, Nos. 1/2, 87–9.

The English summary appended to the paper is as follows:—

"Four cases of human filariasis were detected in the city of Iquitos, in the jungle of Peru. The diagnosis has been made on the basis of microfilariae observed in the circulating blood. Three of the four persons who showed microfilariae in the blood were apparently in good condition of health. Only one, a woman of 70 years old, was hospitalized and died a month later; the autopsy revealed a great number of microfilariae in the pericardial fluid, besides one adult, female specimen of *Mansonella ozzardi* in the mesentery. This would be the first report of *M. ozzardi* in Peru."

KIRK, R. **African Onchocerciasis.** *Central African J. of Med.* 1959, May, v. 5, No. 5, 233–42. [Numerous refs.]

This paper gives an account of the history and present state of knowledge of all aspects of African onchocerciasis—distribution, vectors, possible animal reservoirs, clinical features, treatment and control—in the manner of a short textbook article. It is not possible to summarize so much information presented so concisely: moreover, abstracts of the more important of the many references, which have been selected with skilled judgment, have appeared in

this *Bulletin* in the past. Anyone seeking a short but comprehensive summary of the subject, amply referenced but avoiding entanglement with controversy on aspects such as the aetiology of the posterior ocular lesion, will be well rewarded by consulting the original. *B. B. Waddy*

GRENIER, P. & MOUCHET, J. Première captures, au Cameroun, d'une Simulie du complexe *neavei* sur des crabes de rivières et de *Simulium berneri* Freeman sur des larves d'Éphémères. Remarques sur la signification biologique de ces associations. **[First Finding in the Cameroons of a Simulium of the *S. neavei* Complex on River Crabs and of *Simulium berneri* on Larvae of Ephemerids. Biological Significance of these Associations]** *Bull. Soc. Path. Exot.* 1958, Nov.–Dec., v. 51, No. 6, 968–80, 1 fig. [17 refs.]

CHERRY, J. K. T. **Adenolymphocoele and Elephantiasis in Onchocerciasis.** *East African Med. J.* 1959, Apr., v. 36, No. 4, 224–30, 5 figs.

These curious hanging appendages, known as adenolymphocoeles, were first described in onchocerciasis by VAN DEN BERGHE in 1941 [this *Bulletin*, 1943, v. 40, 162]. Since then they have been generally recognized wherever onchocerciasis occurs. In Uganda cases of elephantiasis of the leg, usually in women, have shown marked improvement after treatment of the accompanying onchocerciasis, and an elephantoid condition around the anus and spreading upwards to the sacrum is occasionally seen, and it also responds, though slowly, to the same treatment. Cases of elephantiasis of the axilla are occasionally met and are due to the same cause. Two illustrative cases are described.

In the first the outstanding feature was an enormous adenolymphocoele (weighing 5·4 kgm.) hanging from the right groin ; on the left thigh there were two smaller ones from the inguinal and femoral regions. After treatment with suramin to a total of 4·5 gm., followed by diethylcarbamazine 5·3 gm. and prednisolone 10 mgm. t.d.s., to control allergic reactions, the larger adenolymphocoele was resected without difficulty.

A line of enlarged lymph nodes was identified along the upper part of the pedicle, and immediately below these, in the centre, was a cavity of 2 oz. capacity. No adult worms could be detected. Microfilariae could be found in small numbers in the skin and one only was observed in the fibrous part of one of the glands. Later the two adenolymphocoeles on the left side were removed, the lower one being associated with a femoral hernia.

The second case occurred in an elderly undersized Musoga male who also showed onchocercal skin changes and readily demonstrable microfilariae, associated with pendulant bilateral tumours hanging from the groins. The biggest adenolymphocoele weighed over 5 kgm. and the smaller 3 kgm. They were covered by skin with many white scars of former sepsis. The histological features were in conformity with the first case except that the hypertrophy of the lymphatics was not so marked. Microfilariae were demonstrated in approximately the same numbers.

The pathogenesis of these tumours appears to be as follows. In heavily infected cases of onchocerciasis, femoral and, to a lesser extent, inguinal glands are very much enlarged, partly due to sepsis and partly to allergy from

microfilariae and their products. Lymph stasis then results, especially over the gland, when the skin thickens and becomes elephantoid. The pouch thus formed then slowly sags and draws the associated gland down into it. The lymph channels enlarge and become hypertrophied in their efforts to pump the lymph past the obstruction in the glands above. When once set in motion the condition tends to be progressive. These tumours are relatively rare in women, unless old and emaciated. Their association with femoral herniae is possibly due to dilatation and stretching of the femoral canal.

[These curious tumours were popularly known as "hanging groins" for many years before their association with onchocerciasis was recognized. See also this *Bulletin*, 1958, v. 55, 1148.] *Philip Manson-Bahr*

SIEDLECKI, E. Badanie włośnicy bezobjawowej w materiale sekcyjnym zwłok ludzkich. **[Investigation on Symptomless Trichinellosis in the Autopsy Material of Human Corpses]** *Acta Parasitologica Polonica.* Warsaw. 1959, v. 7, Nos. 1/12, 161–9.

The English summary appended to the paper is as follows:—

"Using the digestion and trichinoscopic methods of examination the author studied muscle slices collected from the diaphragm and intercostal muscles of 340 human bodies in the Białystok palatinate. In this material the author found 46 cases of symptom-free trichinellosis. This amounts to 13·5% of the cases.

"In the spreading of trichinellosis on the terrain of the Białystok palatinate the environment seems not to play any significant role because the percentage of infested people is in the towns and villages almost the same. The percentage of symptom-free trichinellosis proved to be somewhat higher in women (14·3%) than in men (12·9%). In children up to 10 years symptom-free trichinellosis appears very seldom. In older age-groups the frequency of infection is almost the same in all years.

"Because the trichinellae were of various stages and the reaction of the muscle tissue to them was various in older individuals it points to the fact that one individual may be invaded by trichinellae several times during his life."

DEFICIENCY DISEASES

GIGLIOLI, G. **An Outline of the Nutritional Situation on the Sugar Estates of British Guiana in respect to the Eradication of Malaria. Recent Developments in the Production of Green Vegetables and Fruit by Individual Family Units.** *West Indian Med. J.* 1958, Dec., v. 7, No. 4, 251–6, 4 figs. (2 on 2 pls.)

Malaria was eradicated from the coastlands of British Guiana, along which the sugar estates are distributed, between 1945 and 1950. Comparisons are made between deaths registered on estates during years before and after this event. In 1943 1,466 deaths were registered out of a total estate population of 68,384; in 1957 588 deaths were registered out of a population of 95,173.

The infant mortality rate fell from 147 per 1,000 live births in 1943 to 60 in 1957. The percentage of deaths occurring in the first month of life in relation to total deaths in the first year fell from 45% to 29%. There was a striking disproportion in the sex distribution of deaths in the 16–30 age-groups in 1943, 114 females against 39 males. In 1957 the figures for the 21–40 age-groups, 21 females against 11 males, were disproportionate, but less so, and much lower; crude figures, not percentages, are given and those for 1957 relate to a population nearly one-third larger. During the same period deaths in children 1–5 years old fell by 64%. Deaths registered as due to anaemia fell from 44 to 8.

The improvement in mortality figures between 1943 and 1957 is dramatic. Haemoglobin estimations made during 1957 reveal that there is still room for improvement. A bar diagram shows that in the great majority of males haemoglobin was between 70 and 90%, with about one-tenth exceeding 90%. In healthy females the majority were grouped between 65 and 75%, while in sick and, even more strikingly, pregnant females the peak was at 51–55%. There is evidence of a tendency to a general breakdown in the nutritional balance, especially as regards the B vitamins, of females under the strain of menstruation, pregnancy and lactation. In an effort to combat inadequate nutrition, sugar workers are being granted loans for house building on laid out sites of one-tenth of an acre, and are encouraged to use their plots as kitchen gardens. Results are encouraging.

[The paper provides very striking and valuable statistics. Age and sex breakdown of the mortality figures is given in a bar diagram; except for these, all mortality data comparing 1943 and 1957 have been quoted above. Nevertheless those interested must consult the original.] *B. B. Waddy*

LUYKEN, R., LUYKEN-KONING, F. W. M. & VAN DAM-BAKKER, A. W. I. **Nutrition Survey on the Windward Islands (Netherlands Antilles). I. The Daily Diet and the Results of Chemical Blood Examination.** *Trop. & Geograph. Med.* Amsterdam. 1959, Mar., v. 11, No. 1, 49–56. [16 refs.]

The diets of 279 families living on 3 islands were investigated, each family being studied for one day. The principal foods were bread, rice and sweet potatoes. Bananas and other fruits were plentiful. Most families ate regularly fish and some meat (usually pork). Small amounts of milk were available, but little butter or vegetable fat. Serum protein levels were high, owing to a high content of gamma globulin. *R. Passmore*

GRANT, M. W., TAN PHUI YONG & WADSWORTH, G. R. **The Dietary Pattern of Schoolchildren in the Muar District, Malaya.** *J. Trop. Med. & Hyg.* 1959, May, v. 62, No. 5, 118–22, 3 figs.

This paper reports the results of questioning Chinese and Malay children about their diet in the previous 24 hours. Fresh fruit and vegetables were seldom eaten by the Malay children and it is concluded that most of the diets would be deficient in vitamin A. The Chinese diet was more satisfactory, especially in respect of vitamin A. *R. Passmore*

MANCHANDA, S. S. & GUPTA, H. L. **Infantile Scurvy (Etiologic and Clinical Observations on 25 Cases).** *Indian J. Child Health.* 1959, Apr., v. 8, No. 4, 217–21. [16 refs.]

This paper records 25 cases of scurvy seen in a paediatric unit in Amritsar during 3 years. The age of incidence was from 8 months to 5 years. 3 of the children had been breast-fed by mothers whose diet was very unsatisfactory. [This paper is valuable as a reminder to both physicians and public health authorities that infantile scurvy is not a rare disease in the tropics.]

R. Passmore

POSTMUS, S. **Beriberi of Mother and Child in Burma.** *Trop. & Geograph. Med.* Amsterdam. 1958, Dec., v. 10, No. 4, 363–70.

Many factors, especially the introduction of simple small Japanese mills, have led to a change in the quality of rice eaten in Burma. Whereas formerly in the villages most families home-pounded their own rice, this practice is now in decline. More and more farmers are sending their rice either to small village mills or large mills in the towns and their families are consuming refined white rice. This usually contains less than 75 μgm. of thiamine per 100 gm. and daily intakes of thiamine are below requirements.

Beriberi is now prevalent and affects chiefly infants. The mortality from infantile beriberi is highest in the third and fourth months of life. In poor rural areas 1,365 mothers were examined who had had 4,539 children, of whom 1,183 (26%) were dead. Of these deaths 535 (45%) occurred between the second and fifth month of life. Only 15% of deaths occurred in the first month of life and 6% between the ages of 6 months and 1 year. Thus the greater part of the total infant mortality occurred between 2 and 5 months; this suggests strongly that beriberi was an important cause of these deaths.

Although obvious beriberi was not seen in the mothers, in about 40% the tendon jerks in the legs were sluggish or absent. This would be consistent with the view that thiamine deficiency was widespread. Many of the women complained of inadequate milk supply and in the poor class the average content of the mothers' milk was 7·5 μgm. per 100 ml. (102 samples).

There is little doubt that thiamine deficiency is widespread in Burma. Regular use of UNICEF skimmed milk and thiamine injections markedly improved both mother and child. These are only temporary measures. Improvements in maternal diets and the use of undermilled rice are urgently needed.

R. Passmore

HOLEMANS, K., LAMBRECHTS, A., HUBIN, C. & MARTIN, H. **Nitrogen, Calcium and Phosphorus Balances of the Nursing African Mother. (Evaluation of the Minimal Daily Requirements.)** *J. Trop. Pediatrics.* London. 1959, June, v. 5, No. 1, 27–32, 1 fig. [16 refs.]

The authors aim to show the effect of breast-feeding on the nitrogen, calcium and phosphorus balances of women in Central Africa, where children are nursed until they are 2–3 years old while their mothers continue their heavy agricultural labour.

5 Basuku women of the Feshi territory of Kwango in the Belgian Congo were studied for a period of 10 days. The average weight was 43 kgm. and

they were nursing babies aged from 8 months to 2 years. They were given their usual diet which consisted of cassava and dried fish *ad libitum*. This diet amounted to a daily intake per kgm. body weight of 50 calories, 150 mgm. nitrogen, 10 mgm. calcium, and 15 mgm. phosphorus. A small amount of ^{45}Ca was also given in order to study the endogenous faecal calcium. It has to be pointed out that this diet differed from their usual food because of the rather larger amount of nitrogen derived from the fish given. All of the women had a positive nitrogen balance which the authors interpret as indicating that the previous diet had been poorer in nitrogen than that given in the experiment. The calcium balance was just positive, and the phosphorus balance was definitely positive.

Thus the nursing women in that part of Africa do not seem to suffer from a deficiency of calcium and phosphorus, but there seems to be a deficiency of nitrogen intake. *H. Lehmann*

STANDARD, K. L., WILLS, V. G. & WATERLOW, J. C. **Indirect Indicators of Muscle Mass in Malnourished Infants.** *Amer. J. Clin. Nutrition.* 1959, May–June, v. 7, No. 3, 271–9, 4 figs. [30 refs.]

Although protein malnutrition is common in many parts of the world, there is no reliable method of assessing the extent of the deficiency of protein. This paper presents evidence that the level of urinary creatinine may be a useful measure. Output of creatinine in the urine rises more rapidly on treatment than the increase in body weight. It is argued that if the creatinine excretion is a measure of muscle mass, the deficit in muscle mass on admission to hospital was greater than the deficit in body weight. For comparative purposes, creatinine excretion can be related to height. In a series of 19 malnourished babies, the mean rate excretion of creatinine was 0·79 mgm. day/cm. of height on admission, and after 60 days in hospital the figure had risen to 1·86. This increase was much greater than the increase in weight. *R. Passmore*

ZUIDEMA, P. J. **Cirrhosis and Disseminated Calcification of the Pancreas in Patients with Malnutrition.** *Trop. & Geograph. Med.* Amsterdam 1959, Mar., v. 11, No. 1, 70–74. [16 refs.]

In 4 years 18 patients were seen in Jogjakarta (Java) with calcification of the pancreas. The diagnosis was made by X-ray. The patients usually presented themselves at the hospital complaining of typical symptoms of diabetes. Blood sugar levels were high and large doses of insulin were needed to reduce them. Ketosis was seldom present. Steatorrhea or other evidence of a failure of the external secretion of the pancreas was never found. It is concluded that the condition is not a result of chronic pancreatitis, but probably arises from prolonged protein malnutrition. *R. Passmore*

EDINGTON, G. M. **Nutritional Siderosis in Ghana.** *Central African J. of Med.* 1959, Apr., v. 5, No. 4, 186–9. [17 refs.]

The author has examined for iron pigment the livers of 728 unselected necropsies in Ghana. The distribution of the pigment was classified as follows:

(1) iron pigment present in the Kupffer cells alone, the amount varying from a blue haze to a heavy granular deposit;
(2) iron pigment present in the periportal parenchymal cells alone or in combination with varying amounts in the Kupffer cells;
(3) iron pigment present in large amounts in the portal tracts, parenchymal cells and Kupffer cells;
(4) type 3 distribution in the presence of cirrhosis.

In 94 instances the iron pigment was present in the Kupffer cells alone, the greatest incidence being in the younger age-groups. The causes of death were varied, and it is thought unlikely that a haemolytic anaemia was responsible, unless malaria could be implicated. However, siderosis occurs in South Africa where malaria is rare, and it is absent in East Africa where malaria is common. Furthermore, in Ghana the author has found no iron pigment in a number of livers which contained heavy deposits of malarial pigment. In 189 necropsies the iron deposition in liver and spleen were compared, and in 41 specimens where iron was found in the Kupffer cells only, as much—or more—iron was found in the spleen as in the liver. However, in 45 necropsies where the liver showed a Type 2 siderosis, 6 showed no iron in the spleen, and 10 less iron in the spleen than in the liver. Even in 21 necropsies with livers of Types 3 and 4, 4 showed less iron in the liver than in the spleen.

These facts suggest that the deposition of iron in siderosis in Ghana is not always reticulo-endothelial [this *Bulletin*, 1954, v. 51, 224], and the author refers to a previous publication where he suggested that there are two types of iron deposition in Ghana (*Méd. d'Afrique Noire*, 1956, v. 4, 5), one mainly reticulo-endothelial, and the other predominantly parenchymal. *H. Lehmann*

GILLMAN, T., HATHORN, M. & LAMONT, N. M. **Liver Disease in Durban Africans. Histopathological Findings in Biopsies.** *South African J. Med. Sci.* 1958, Dec., v. 23, Nos. 3/4, 187–200, 3 text figs. & 6 figs. on pl. [31 refs.]

Needle biopsy of the liver was performed in 200 male African patients with suspected liver disease in Durban. As in previous investigations [this *Bulletin*, 1952, v. 49, 1166; 1954, v. 51, 224; 1957, v. 54, 1132], some degree of siderosis was found in the majority (88%). Its presence was recorded as: no siderosis in 12%; hepatocellular siderosis in 12·5%; Kupffer cell siderosis in 4%; early portal siderosis in 32%; advanced portal siderosis in 39·5%.

In respect of fibrosis, the liver biopsies could also be divided into 5 groups:—(a) no fibrosis—24%, (b) portal fibrosis, *i.e.* fibrous tissue in and around portal tracts, without lobular distortion—43%, (c) portal cirrhosis, *i.e.* portal fibrosis with lobular distortion—18·5%, (d) portal cirrhosis plus post-necrotic scarring—4%, (e) post-necrotic scarring only—10·5%. The authors are satisfied that distinction between the last-named groups can be made with reasonable certainty from biopsies.

The incidence of these changes at various ages is shown by histograms. For all ages, the correlation between siderosis and the type of fibrosis is presented in a third histogram ("Text Fig. 3"). Siderosis increased from fibrosis group (a) to group (c), and decreased again from fibrosis group (d) to (e); and "The X^2 test, applied to the data from which Text Figure 3 was compiled,

showed a significant relationship between portal cirrhosis and advanced portal siderosis ". This suggests that the presence of iron in the portal tracts may indeed be fibrogenic.

In a full discussion the authors develop the view that nutritionally induced hypoxia of the liver parenchyma may initiate fibrosis; since it may also increase iron uptake from a diet rich in iron, and since this iron deposited in the liver may itself be fibrogenic, they conclude that " it would still seem untimely to dismiss malnutrition in adulthood as an important factor at least predisposing towards if not directly causing liver diseases among adult Africans ".

[See also this *Bulletin*, 1959, v. 56, 350.] *Alan B. Raper*

LAMONT, N. McE., GILLMAN, T. & HATHORN, M. **Syndrome of Nutritional Siderosis in an Indian in Durban.** *Brit. Med. J.* 1959, May 30, 1391–2, 3 figs.

This paper reports the findings in an Indian male aged 28 with siderosis. He presented with a large liver and a history of regular consumption of kaffir beer. Liver biopsy showed portal fibrosis with large amounts of iron-containing pigment in the portal spaces. Samples of the kaffir beer were rich in iron (4·8 mgm./100 ml.) and it is suggested that this was the source of the excess iron in the liver. *R. Passmore*

HAEMATOLOGY

JOUBERT, S. M. & HOOKINS, Kitty W. **A Comparative Study of Serum Protein Moieties in European, African and Indian Adult Populations of Durban.** *South African J. Lab. & Clin. Med.* 1959, Mar., v. 5, No. 1, 1–15. [23 refs.]

Differences in the serum proteins of Africans as compared with Europeans are very well documented, and the present paper establishes the magnitude of differences in sera from typical adult Africans (100), Europeans (50), and Indians (40), in the area of Durban. All subjects enjoyed subjective and objective good health and were capable of earning their living. Of the European group 20 were male and 30 female. The other two groups were all male. All were between 16 and 40 years old. The sera from the Europeans and Indians were obtained while the subjects were fasting, and from the Africans where it was not possible to ensure fasting specimens, blood was collected in the early morning between 8 a.m. and 9 a.m., and any lipaemic specimens were discarded.

Both Europeans and Indians had higher serum albumin levels than the Africans. The most striking difference was found in the gamma globulins. The range for gamma globulin percentage in the Europeans was from 0·91 to 1·40 gm.%; 4 of 40 Indians and 92 of 99 Africans had gamma globulin values above the European range. There was also a significant difference

between Indians and Europeans in the values for alpha$_2$ and beta globulin. On the other hand, Africans and Europeans differed significantly in their alpha$_1$ and beta globulins, but not in the alpha$_2$ globulins.

Mean Values gm. %	Africans	Indians	Europeans
Total Protein	7·13 ± 0·32	7·07 ± 0·40	6·83 ± 0·30
Albumin	3·21 ± 0·48	3·58 ± 0·28	3·61 ± 0·2
Gamma Globulin	1·65 ± 0·20	1·29 ± 0·09	1·12 ± 0·09

The mean zinc sulphate turbidity was 12 units in the Africans and 5 units in the Europeans and Indians. The mean thymol turbidity was 4 units in the Africans and 2 units in the Europeans and Indians.

The authors discuss whether the differences in serum proteins are genetic or environmental. The groups were not comparable by race alone. For practical purposes, the racial classification constituted a classification by economic status. Nevertheless, the authors point out that a good deal of work has been done in the last 5 years on the haptoglobins in different races [here is a misprint: " hepato-globulins "]. It may be necessary to be cautious before dismissing genetical factors as unimportant in determining the gamma globulin concentration.

Could it not be, the authors ask, that in the tropics those born with an increased gamma globulin concentration—or capable of increasing the gamma globulin concentration to a greater degree than Europeans—would be favoured in their survival? *H. Lehmann*

Foy, H. & Kondi, Athena. **Hypochromic Anemias of the Tropics associated with Pyridoxine and Nicotinic Acid Deficiency.** *Blood.* 1958, Nov., v. 13, No. 11, 1054–62, 2 figs. [36 refs.]

The literature concerning the association between pyridoxine deficiency and anaemia is here first reviewed and details are then given of 2 African patients with an iron-deficient anaemia who failed to respond to orally administered iron but who responded, in one case to pyridoxine and in the other to nicotinic acid plus iron.

The first patient's haemoglobin was initially 8·3 gm. per 100 ml., the MCHC 24%, and the MCV 83 μ^3. The marrow was erythronormoblastic with rare giant stab-cells. During treatment with 30 grains ferrous sulphate administered orally daily for 17 days the haemoglobin fell slightly and there was no reticulocyte response; 20 mgm. pyridoxine was then given orally daily and continued for 14 days. The reticulocytes rose from approximately 2% to 7·5% 3 days after this treatment had commenced and at the conclusion of the course the haemoglobin value was 11·0 gm. per 100 ml.

In the second case no improvement in the haemoglobin occurred as the result of treatment with 30 grains ferrous sulphate administered orally daily for 11 days. Intravenous injections of 100 mgm. nicotinic acid were then given daily for 8 days and followed by the same amount administered orally daily for 5 days. The reticulocytes rose from 2 to 3% the day after the first injection of nicotinic acid had been given and reached a maximum of just over 5% 3 days later. The haemoglobin rose from 8 gm.% before commencement of nicotinic acid therapy to 12·4 gm.% 7 days after completion of the therapy.

In Nairobi, Kenya, where the patients were studied, " pure " iron deficient anaemia is, it is reported, rare [this *Bulletin*, 1958, v. 55, 683] and the authors were not surprised that these 2 patients failed to respond to iron therapy alone. They consider pyridoxine to be in some way associated with haemopoiesis and, though its absence does not always cause anaemia, it may produce abnormalities in red and white cell maturation and haemoglobin production. The role of nicotinic acid in haemopoiesis is, it is stated, obscure. *A. W. Woodruff*

HUANG, Po-Chao & TUNG, Ta-Cheng. **The Effect of Vitamin B Complex on Hematopoiesis. III. Studies with a Small Group of Anemic Children.** *J. Formosan Med. Ass.* 1959, Feb. 28, v. 58, No. 2, 74–9, 2 figs.

The English summary appended to the paper is as follows:—

" Twelve children who had slight to moderate degrees of anemia due to ancylostomiasis, were treated with iron with or without vitamin B complex.

" Reticulocyte count and hemoglobin concentration were followed up for a month as the criteria for judging the effect of vitamin B complex supplements. The vitamin supplements had no appreciable effect on the recovery from anemia in this study."

TASKER, P. W. G. **Concealed Megaloblastic Anaemia.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1959, May, v. 53, No. 3, 291–5, 2 figs. & 2 pls. [17 refs.]

When multiple deficiencies of haemopoietic factors exist, the resultant state of the peripheral blood may be a mixed or indeterminate one, or may have the characteristics of only a single deficiency state. The bone marrow generally presents a clearer picture, but among some 1,300 patients studied for anaemia in Kuala Lumpur the author found 25 instances in which there was a characteristic iron-deficiency anaemia and a typically normoblastic bone marrow (except that in all but 4 patients a few giant metamyelocytes were seen); nevertheless there was a negligible response to parenteral iron therapy, while subsequent examination of the marrow revealed a fully megaloblastic picture. In a further 17 patients there was a somewhat greater response to iron, followed by an intermediate megaloblastic change in the marrow. The MCV however did not rise above 98 cμ, nor the MCHC above 31%, *i.e.* the peripheral blood did not reflect the megaloblastic state of the blood precursors. A full response to folic acid was subsequently demonstrated.

The author suggests that in his patients the folic acid stores were defective, but just sufficient to prevent megaloblastic changes; new cells produced under iron medication quickly exhausted the available supplies, and therefore a megaloblastic change followed.

Because of the failure of the haematological pattern to reflect the true state of affairs in mixed deficiencies, adequate therapeutic trials may be the most reliable way of discovering what deficiencies exist.

[It is remarkable that iron therapy did not produce a "dimorphic" or "precoctic" picture, as it does in uncomplicated iron deficiency. It may be supposed that the other deficiencies present interfered with the full utilization of iron, or that there was a failure to release newly-formed cells from the marrow.]

Alan B. Raper

LEHMANN, H. Die Hämoglobinopathien. [**The Haemoglobinopathies**] *Deut. med. Woch.* 1959, July 10, v. 84, No. 28, 1253–5, 1267, 1287, 2 figs. (1 on pl.) [16 refs.]

A short general account. [See also this *Bulletin*, 1957, v. 54, 745.]

RÖMER, M. A. Consideraciones sobre la thalassemia con motivo de la comprobación de los primeros casos en Venezuela. [**Observations on Thalassaemia in Relation to the First Cases in Venezuela**] *Gac. Méd. de Caracas.* 1958, Jan.–Mar., v. 66, Nos. 1/3, 27–36.

The English summary appended to the paper is as follows:—

"A brief report about the etiology, physiopathology, clinical picture and diagnosis of thalassemia is made, and the different theories about the site of appearance of the original mutation are considered. The author believes, based on his own works about thalassemia in Persians, that the mutation took place in Asia. Special importance is given to the diagnosis of carriers, as the only possibility of preventing unfortunate marriages between them. The cases studied were found in an Italian family living for 10 years in Venezuela and are the first reported in this country. Subsequently he found another case in a Venezuelan woman with Spanish ancestors. Apparently the trait is more common in Venezuela than expected previously. It should not be uncommon in Spain, where only 3 cases of Cooley's anemia have been reported. Finally, the possibility that thalassemia occurs in natives of the American continent is considered."

SUAREZ, R. M., BUSO, R., MEYER, L. M. & OLAVARRIETA, S. T. **Distribution of Abnormal Hemoglobins in Puerto Rico and Survival Studies of Red Blood Cells using Cr.** *Blood.* 1959, Mar., v. 14, No. 3, 255–61, 1 fig. [15 refs.]

In 602 Puerto Rican "Negroes", filter paper electrophoresis revealed the haemoglobin combinations AS in 4·82%, SS in 0·33%, AC in 1·16%, CC in 0·17%, and SC in 0·33%. By the use of radioactive Cr "The 'apparent' half-life of the red blood cells was found to be 10 days in sickle cell anemia, 7 days in SC disease, 20·6 days in cases of hemoglobin SA, 18·5 days in one case of hemoglobin C disease and 21·5 days in 2 cases of the combination CA. The normal 'apparent' half-life in our laboratory is 24·5 days".

Alan B. Raper

HALL, L. **A Case of Sickle Cell Disease in Kenya.** *East African Med. J.* 1959, May, v. 35, No. 5, 268–73, 4 figs. [10 refs.]

" A case of sickle cell anaemia in an African child of four years is reported from Kenya. Notable features were the presence of ascites and of signs which would, in the absence of the disease, have suggested aortic stenosis."

MARTIN, W. W., Jr., KOUGH, R. H. & BRANCHE, G. C., Jr. **Hereditary Spherocytosis-Sicklemia in the Negro. Case Report and Study of a Negro Family having Multiple Instances of Hereditary Sperocytosis.** *Blood.* 1959, June, v, 14, No. 2, 688–93, 1 fig. [18 refs.]

The English summary appended to this paper is as follows:—

" 1. A case of coexistent hereditary spherocytosis and sicklemia in a Negro female is reported. Hematologic and clinical amelioration followed splenectomy.

" 2. Study of three generations of the family of the propositus revealed one additional case of hereditary spherocytosis-sicklemia and 10 cases of hereditary spherocytosis in the Negro.

" 3. Further evidence is adduced that the combination of this heterozygous hemoglobinopathy with the red blood cell defect of hereditary spherocytosis produces an illness which is not grossly different from hereditary spherocytosis with normal hemoglobin."

[See also this *Bulletin*, 1956, v. 53, 923 ; 1959, v. 56, 763.]

OLINER, H. L. & HELLER, P. **Megaloblastic Erythropoiesis and Acquired Hemolysis in Sickle-Cell Anemia.** *New England J. of Med.* 1959, July, 2, v. 261, No. 1, 19–22, 4 figs.

PATERSON, J. C. S. & SPRAGUE, C. C. **Observation on the Genesis of Crises in Sickle Cell Anemia.** *Ann. Intern. Med.* 1959, June, v. 50, No. 6, 1502–7, 1 fig. [20 refs.]

" The frequent association of infection with crises in sickle cell anemia has long been known, and patients with sickle cell anemia have been considered unduly susceptible to infection. Furthermore, transfusion reactions occur with unusual frequency in patients with sickle cell anemia.

" Two patients are described in whom crises were precipitated by blood transfusion. In one, a crisis with abdominal and joint pains and hemolysis of the patient's sickle cells occurred. In the other, a painful crisis occurred, the transfused normal cells exhibiting a normal survival time. These crises were attributed to pyrogenic reactions.

" The mechanism whereby fever may precipitate a crisis is discussed, and if this interpretation be accepted, it follows that in the treatment of crises considerable attention should be paid to lowering fever."

SHERMAN, Mary. **Pathogenesis of Disintegration of the Hip in Sickle Cell Anemia.** *Southern Med. J.* 1959, June, v. 52, No. 6, 632–7, 14 figs.

EPIDEMIC DROPSY

MULLICK, D. N. **Toxicity Limit of Argimone Oil.** *Indian J. Med. Res.* 1959, May, v. 47, No. 3, 311–17, 2 graphs & 3 figs. on pl.

"1. It has been established that the cause of epidemic dropsy in man is due to the adulteration of mustard oil with argimone oil, but references are not available in the literature on the lower limit of argimone oil in mustard oil which may be responsible for the development of this pathological condition. The present investigation has been undertaken to find out the tolerance limit of argimone oil in mustard oil. Twenty-four male and 24 female rats, at weaning, were divided into six groups of 4 male and 4 female rats in each group. The synthetic diet fed to all the groups was supplemented with different quantities of argimone oil and the observations were continued for 40 weeks.

"2. Records of weekly body-weight, clinical condition, mortality reproductive performance, haemoglobin concentration and feed consumption were maintained.

"3. The retarded rate of growth was proportional to the increased concentration of the argimone oil and the differences became conspicuous in the animals after 10 to 11 weeks on these diets. Though the animals of different groups showed decline in the rate of growth yet the clinical conditions were not conspicuous and mortality was not recorded till 24 weeks. The females of the control, 0·5 c.c., 1·0 c.c. groups were able to produce litters. The higher supplemented groups showed lower haemoglobin concentration and lesser ingestion of feed.

"4. It may be that the presence of argimone oil from 1·0 c.c. upwards, in the diet, limits the intake of nutrients which may be the immediate cause of the slower rate of growth and lower haemoglobin concentration. Later on, due to malnutrition, after 24 weeks, the clinical symptoms develop and the animals become susceptible to various types of diseases, especially diarrhoea and pneumonia."

VENOMS AND ANTIVENENES

PHILPOT, V. B., Jr. **Activation of Venom Proteases and Reversal of Chelating Effects by Sodium Bicarbonate.** *Proc. Soc. Exper. Biol. & Med.* 1959, May, v. 101, No. 1, 78–80.

SILVA JÚNIOR, M. **O Ofidismo no Brasil.** [Snakes in Brazil]

This book was reviewed on p. 995.

WEISSMAN, A. & SHULOV, A. **Investigations on the Venom of the Scorpion** *Buthotus* (*Buthus*) *judaicus* **E. Sim.** *Arch. Inst. Pasteur d'Algérie.* 1959, Mar., v. 37, No. 1, 202–17, 2 figs. [17 refs.]

The English summary appended to the paper is as follows:—

"An investigation has been conducted into the potency of the scorpion *Buthus judaicus* E. Sim. administered subcutaneously to white mice.

"The LD_{50} was determined on the basis of the normal logarithmic curve and the mortality rate of the mice to be $127\ \gamma\ ^{+20}_{-18}$.

"*In vitro* experiments on the hemolytic, coagulatory, anti-coagulatory and proteolytic properties of the venom of the black scorpion showed these properties to be lacking from the venom under the experimental conditions employed, except perhaps for a slight degree of anti-coagulatory power.

"These negative results, together with our observations on the scorpion venom when administered to laboratory animals either through stinging or the injection of lyophilised venom, lead us to suggest that the effect of the venom on the living organism is chiefly neurotoxic in nature."

SHULOV, A. & AMITAI, P. Observations sur les scorpions *Buthus occitanus* ssp. *Mardochei* var. *Israelis* var. nov. [**Observations on Scorpions.** *Buthus occitanus mardochei* **var.** *israelis,* **var. nov.**] *Arch. Inst. Pasteur d'Algérie.* 1959, Mar., v. 37, No. 1, 218–25, 3 figs.

SCHENONE, H., SEMPREVIVO, L. & SCHIRMER, E. Consideraciones a propósito de dos casos de Loxoscelismo cutáneo-visceral. [**Considerations on 2 Cases of Cutaneous-Visceral Loxoscelism**] *Bol. Chileno de Parasit.* 1959, Jan.–Mar., v. 14, No. 1, 17–19. [12 refs.]

The English summary appended to the paper is as follows:—

"Two severe cases of arachnidism by *Loxosceles laeta* are reported. One of the patients, an 18 years old man, died after 31 hours of the bite, while the other, a 3 years old girl, recovered after parenteral treatment with Prednisolone acetate."

WIENER, S. **Observations on the Venom of the Stone Fish** (*Synanceja trachynis*). *Med. J. Australia.* 1959, May 9, v. 1, No. 19, 620–27, 6 figs. [11 refs.]

"A method is described for obtaining venom from the dorsal spines of the stone fish. The yield of dried venom per fish ranged from 49 mg. to 88 mg.

"Stone-fish venom was toxic to mice, guinea-pigs, dogs and fowls. The dose of venom and its route of injection influenced the manifestations of intoxication, which are described in detail.

"The injection of stone-fish venom into animals produced the following effects: pain, necrosis of the skin, irregular respiration, bradycardia, pulmonary oedema, incoordination, weakness, paralysis, hypotension and an increase in capillary permeability.

"In mice, the LD_{50} dose of venom when injected intracerebrally, intravenously, intraperitoneally and subcutaneously was 0·004 mg., 0·007 mg., 0·03 mg. and 0·05 mg. respectively.

"Stone-fish venom behaved as an unstable protein; its toxicity was destroyed by repeated freezing, by heating at 50° C., and by changes of pH. It was also antigenic.

"Oxidising agents and certain basic and acid dyes destroyed the toxicity of venom.

"In mice, potassium permanganate and congo red neutralized the toxic action of stone-fish venom *in vivo* under certain conditions.

"The significance of these findings in relation to stone-fish stings in man are discussed."

TOXOPLASMOSIS

HORIMOTO, T. [**A Study on Toxoplasmosis on Dye-Test and Intradermal Reaction**] *J. Osaka City Med. Center.* 1958, Oct., v. 7, No. 10, 1018–39, 2 charts. [57 refs.] [In Japanese.]

The English summary appended to the paper is as follows:—

"In studying toxoplasmosis, 741 subjects consisting of kindergarten children, healthy human adults, various pediatric cases, feeble minded and psychotic cases have been examined during January 1957 and April 1958 on dye-test and intradermal reaction with the following results:

"1) Positive rates on dye-test and intradermal reaction are higher for females than males.

"2) On dye-test, the higher the positive rate, the higher the intradermal reaction. But positive intradermal reactors are not always dye-test positive.

"3) On dye-test, the older the examinee the lower the positive rate.

"4) With the minimum positive limit of over 1 : 4 on dye-test, the kindergarten children surveyed are positive in 4·7 per cent., adults in 6·8 per cent., pediatric cases in 1·2 per cent, feeble minded in 18·3 per cent. and psychotic cases in 23·3 per cent.

"5) Of the feeble minded examined, the lower their intelligent quotient, the higher their positive rates on dye-test and intradermal reaction. Those who are intradermal reaction positive are 16·2 per cent. With the minimum positive limit of over 1 : 4 those who are both intradermal reaction and dye-test positive are 6·8 per cent.; with 1 : 16, 2 per cent. Those who are specifically diagnosed further than mere feeble mindedness show higher intradermal and dye-test reactions than mere feeble minded cases.

"6) Regarding the relationship between the disease and the result of dye-test, it is revealed that those with cerebroneurotic disturbances such as feeble mindedness and epilepsy show rather high positive rates of 20–30 per cent. on dye-test.

"7) No Toxoplasma gondii has been detected from examinees in the present study. Positive reactors with a high titer of 1 : 1024 have been observed and a relationship between toxoplasmosis and higher titers is discussed."

CARDELLE, G.; CURBELO, A.; DÍAZ CARRAL, Maria del C.; VARELA, G.; ROCH, E.; MÁRQUEZ, V.; MARRERO, E. Toxoplasmosis. III. Resultados de la intradermoreacción a la toxoplasmina en diversos estados patológicos y comparación con el Dye-Test. [**Toxoplasmosis. III. Toxoplasmin Skin Reaction in Different Pathological Conditions and Comparison with the Dye Test**] [CARDELLE, CURBELO & DÍAZ CARRAL] *Rev. Cubana Lab. Clin.* 1959, Jan.–Feb.–Mar., v. 13, No. 1, 14–29. [17 refs.] IV. Los anticuerpos de Toxoplasma en la población sana infantil de La Habana. [**IV. *Toxoplasma* Antibodies in Healthy Children in Havana**] [VARELA, ROCH, CURBELO, MÁRQUEZ, CARDELLE & MARRERO]. *Ibid.*, Apr.–May–June, No. 2, 43–4.

The English summaries appended to the paper are as follows:—

III. "Skin tests with an antigen made from mouse peritoneal exudate were performed to a total of 115 subjects. From 86 children under 15 years of age, the skin test was positive in 4 or 4·6%. Over 48 children of this group in whom dye-tests of Sabin-Feldman were made, positive results were obtained in 16 or 33·3%. These findings suggest that skin sensitization is a slow and late process while the antibodies responsible for dye-test are formed quickly after the acquisition of toxoplasmic infection.

"Toxoplasmin intradermal test and Sabin-Feldman dye-test were both positive in a case of congenital toxoplasmosis and in several patients with chronic chorio-retinitis that had been shown to be related to toxoplasmosis; while in several patients with infectious hepatitis, infectious mononucleosis, acute secondary lymphadenitis due to streptococcus or staphylococcus, rubeola, etc., they were entirely negative. They were negative too in certain chronic conditions as mongolism, obstructive jaundice due to inspissated meconium, and so forth.

"It was observed that there was an accumulation of positive results of the dye-test in cases of torpid acute and subacute lymphadenopathies, acute exanthematas with adenopathy and epilepsies, which suggests a causal relationship between these conditions. The proofs afforded in this limited study are only suggestive and not conclusive; but it looks to the authors that it would be worth while to continue a more complete and extensive research in this field. The data suggest that there are numerous mild or asymptomatic forms of the disease, possibly with a limited duration of the antibody response of the organism to the parasite, remaining only an amnestic reaction as a testimony of the former infection."

IV. "In this paper we are reporting the results obtained with the Sabin-Feldman dye-test in the serum of 94 children between newly born and 19 years of age.

"Serological tests of significant titer were obtained in 0% between 0 and 4 years; in 34·3% between 4 and 9 years; and, 43·3% between 10 and 19 years; it is said, it increases with age. These results are similar to those obtained in tropical countries where Toxoplasmosis is prevalent."

[See also this *Bulletin*, 1959, v. 56, 480.]

TROPICAL OPHTHALMOLOGY

RENOUX, G., NATAF, R. & GIROUD, P. La culture du virus trachomateux. **[The Cultivation of Trachoma Virus]** *Rev. Internat. du Trachome.* 1959, v. 36, No. 2, 182–90.

3 strains were isolated by inoculating 9-to-11-day eggs on the chorioallantoic membrane with ground suspensions of conjunctival fragments; passage in eggs was obtained. Pulmonary lesions were produced in small rodents (white mice; jerbils; meriones) by the injection of similar suspensions.

Altogether 6 strains have been established 2 of which—1 rodent and 1 egg—have been extensively studied. The rodent strain has been passed 26 times and the egg strain, transferred to mice after the 3rd egg passage, has been through 28 rodent passages. 2 young male volunteers have been successfully inoculated on the conjuctiva, one with the rodent strain at the 7th passage, the other with the egg strain after 7 rodent passages; they developed agglutinins for a suspension of virus prepared from the egg strain. The sera from 14 patients with trachoma were examined; 12 agglutinated this viral suspension at titres between 1 in 10 and 1 in 80; only 1 agglutinated a suspension of psittacosis virus. *S. P. Bedson*

MISCELLANEOUS DISEASES

DANARAJ, T. J., DA SILVA, L. S. & SCHACHER, J. F. **The Serological Diagnosis of Eosinophilic Lung (Tropical Eosinophilia) and its Etiological Implications.** *Amer. J. Trop. Med. & Hyg.* 1959, Mar., v. 8, No. 2, Pt. 1, 151–9. [56 refs.]

"The complement fixation test using as antigen a 1% alcoholic extract of dried *D. immitis* powder was applied to the sera of: 228 persons with hypereosinophilia of 3,000 or more cells per cu. mm, 213 of whom were diagnosed as eosinophilic lung; 85 persons with mild eosinophilia of less than 3,000 cells per cu. mm; 119 cases of human filariasis; 33 dogs with *D. immitis* infection; 30 cases of severe ascariasis; 160 normal individuals [all in Malaya]. The test was positive, in the majority of instances in high titer, in 95·3% of the cases of eosinophilic lung, whereas in the various control groups, positive reactions in relatively low titers were obtained in only 5·6% to 21·2% of cases. After treatment with diethylcarbamazine, the FCFT titers gradually diminished in all the patients suffering from eosinophilic lung, becoming negative in 95·4% of those who had completed the full observation period of 30 weeks."

These results suggest that the complement-fixation test can be used to differentiate eosinophilic lung from other conditions associated with eosinophilia and can be used in the diagnosis of atypical cases.

Eosinophilic lung occurs in areas where filariasis, both human and animal,

occur; those suffering from eosinophilic lung are sensitive to filarial proteins, and this association suggests that a filarial infection, not necessarily human, may be a cause. *W. E. Kershaw*

RAPER, A. B. **The Incidence of Peptic Ulceration in some African Tribal Groups.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1958, Nov., v. 52, No. 6, 535–46. [28 refs.]

This study was undertaken because although peptic ulcer was generally believed to be rare in Africans, a relatively high incidence had been reported from Ruanda, which lies to the south-west of Uganda and from which come many of the poorer immigrants to the Protectorate. Recognizing the fallacies of a retrospective analysis of post-mortem reports in which the stomach and duodenum may not have been examined carefully as a routine, the author started a new series in Kampala in 1951 in which such systematic examination was made in all autopsies, and negative findings were recorded. This report deals with the material collected up to 1956 and is divided into 222 " Police Cases ", *i.e.* autopsies performed for the Coroner on bodies brought to the public mortuary and on hospital patients believed to have died an unnatural death, and 654 " Hospital Cases ", *i.e.* patients dying in Mulago Hospital. This latter group is selected, and tended to exclude mainly children, Moslem subjects and the more socially important local persons. Some choice, rejecting about one-quarter of cases in which autopsy would have been permissible, was made by the pathologist according to the usual criteria, time available, doubt of the diagnosis, and the clinician's and pathologist's personal interest. These factors probably introduced little if any bias as in only 5 patients had the diagnosis of peptic ulcer been made ante-mortem.

Among the 647 men in the total series there was evidence of 99 ulcers, a remarkably high incidence of 15·3%; among the 129 women there were 6 with ulcers, a rate of 4·6%. When allowance had been made for age differences the " hospital " and " police " series produced essentially similar rates. When examined by tribal group the highest incidence in men, 20·6%, was found in the immigrants from the south-west; the local people, mainly Ganda, had a rate of 13·7%. The lowest rate, 5·4%, was found in the Nilotic immigrants. It is suggested that these differences may be explained by the different living conditions and not by racial susceptibility; the Nilotics are in regular employment in the police, railways and other services, the Ruanda immigrants are the poorest group in casual employment and have poor diet, and the Ganda occupy an intermediate position.

In both hospital and police cases the ratio of duodenal to gastric ulcers in men was over 6 to 1. In the duodenal cases active ulcers and healed scars were equally common, but in the small gastric series active ulcers were proportionately more frequent. In general the ulcers had provoked very little in the way of recognized clinical symptoms. The ulcer was the cause of death in 3 of the 5 patients diagnosed before autopsy, and in 6 others undiagnosed before death.

The author believes that in the future peptic ulcers will be increasingly recognized in Africans, both as a result of increasing medical services and

because with the reduction of other causes of morbidity Africans will complain more commonly of ulcer pain.

[For references to other records from Africa, see this *Bulletin*, 1958, v. 55, 1171 ; 1959, v. 56, 661.] *J. Knowelden*

ONORI, E. **Peptic Ulcer at the Gold Coast Hospital.** *West African Med. J.* 1959, Apr., v. 8 (n.s.), No. 2, 84–6, 3 figs. [12 refs.]

KONSTAM, P. G. **Peptic Ulcer in India.** *Indian J. Med. Sci.* 1959, June, v. 13, No. 6, 486–92. [21 refs.]

ENCYCLOPÉDIE MÉDICO-CHIRURGICALE. 1959. Receuil No. 29–30, Cahier 39–40, loose leaf pp., numerous figs. [Numerous refs.] **Maladies infectieuses** [Infectious Diseases] DEBRÉ, R. (Edited by). **Maladies parasitaires** [Parasitic Diseases] GALLIARD, H. (Edited by). Paris VIe: Editions Techniques S.A., 18, rue Séguier.

This series has already covered an immense field of infectious diseases. It consists of essays on the various subjects, prepared with care by expert authors ; each essay usually contains a select bibliography. The essays are in the French language, and cover all aspects of the diseases—epidemiology, aetiology, transmission, clinical subjects and so on—and are in fact up-to-date accounts of great value for students and teachers. They contain considerable detail, and are well and clearly set out and illustrated. They are produced in a form which can be bound in a loose-leaf system, and old essays can therefore be replaced when new essays are prepared. In this way the student or practitioner can keep himself informed in a tidy and effective way. The printing and paper are both very good indeed.

The present collection contains separate essays on corticotherapy (H. E. BRISSAUD and J. RAYNAUD), *Haemophilus influenzae* infections (D. CHRISTOL), fuso-spirochaetal infections (P. GRENET and G. MARTIN), glanders (P. SAURAT), intestinal flagellates (J. LAPIERRE), *Trichomonas vaginalis* infections (A. SIBOULET), 3 essays on certain fevers of the typhus group (J. THIODET and A. FOURRIER), trichinosis (H. GALLIARD), *Enterobius* and *Trichuris* infections (J. LAPIERRE), *Strongyloides* infections (H. GALLIARD), certain blastomycoses (J. LÔBO), and histoplasmosis (M. ANSEL-D'IMEUX).

This collection in general can be strongly recommended.

Charles Wilcocks

PARASITOLOGY: GENERAL

CHAUHAN, B. S. **A List of References relating to Indian Zoology (dealing with General Parasitology, excluding Helminthology) published during the Years 1938–1950.** *Rec. Indian Mus.* 1954, June–Dec., v. 52, Pts. 2/4, 367–86. [Numerous refs.]

Ricci, M. & Corbo, S. Parassitismo intestinale e posizione auxologica del bambino. (Nota II.) [**Intestinal Parasites and their Relation to the Growth of Children**] *Riv. di Parassit.* Rome. 1959, Mar., v. 20, No. 1, 33–47, 6 figs.

In this, the second part of their investigation [see this *Bulletin*, 1959, v. 56, 234], the authors examined the same schoolchildren as previously, in all 767. 60 had no intestinal parasites, 191 had 1, 238 had 2, 170 had 3, and 108 had 4 or more parasites, these being *Giardia*, *Enterobius*, *Trichuris*, *Ascaris* and *Hymenolepis nana*. This time they used Correnti's auxograms instead of the De Toni standards used in the first investigation. Correnti's auxograms consist according to the present authors of the following: (1) a morphological attribute based on height and chest measurement; (2) a chronological attribute, which combines these 2 measurements with age; (3) a weight attribute which is a comparison of the place on auxogram 1 with the point representing the height-weight auxogram; (4) calculation of the height and weight in relation to age. The authors consider that morphology and weight have only relative values while Correnti did not regard the height-weight-age as of much value.

A series of histograms and graphs are given and from the former it appears that *Ascaris* was present either alone or combined with other parasites in 147 children, and *Hymenolepis* in 61. The findings showed that there was some slight evidence that children with 4 or more parasites tended to be shorter than the average; as regards item 2, the difference between children below the average and those of average height was statistically significant; this was also the case in the height-weight-age calculation.

As the result of this and the previous investigation, the authors conclude that though a negative action exercised by intestinal parasites has not been proved incontrovertibly, a number of facts have been collected suggesting that such an action exists.

[In the review of the first part of this investigation the term "dwarf" was used instead of "hyposomic dwarfism"; the meaning is not the same. The comment was made that *Ascaris* infection was not common; this should have read "*Ascaris* infection without other helminth infections was not common".

It was also stated that the population was not compared with a standard, but this is not correct since the De Toni tables, which were used by the authors, are standards based on one or more populations.] *W. K. Dunscombe*

Wysocka, F., Uminski, J., Marganska, M. & Tos-Luty, S. Badania nad stopniem rozpowszechnienia pasożytów jelitowych u ludności wiejskiej na Lubelszczyźnie. [**Investigations on Infections with Intestinal Parasites in the Rural Population of the Lublin District**] *Ann. Univ. Mariae Curie-Skłodowska.* Lublin. Sect. D. 1957, v. 12, 21–39, 9 figs. [15 refs.] English summary.

Between 1953 and 1956 an investigation was made of the incidence of intestinal parasites among 2,203 inhabitants of rural areas in 4 districts of the province of Lublin in Poland. Sanitary conditions in the areas investigated were very bad, and were made worse by the periodic flooding of a river subjected to heavy faecal contamination. Pathogenic intestinal parasites were found in 71·6% of 1,470 persons, and up to 91·5% in individual localities.

The incidence of trichuriasis in the 4 districts ranged from 21 to 48·5%, of enterobiasis from 30·8 to 55·1%, of ascariasis from 15·8 to 41·2%, of giardiasis from 2·8 to 8·2%, and of infection with *Entamoeba coli* from 18·5 to 30%.

D. J. Bauer

De Morais, T. i. Subsídios para o estudo da prevalência e distribuição das parasitoses intestinais no Distrito do Niassa (A. O. P.). [**Prevalence and Incidence of Intestinal Parasites in the Niassa District, Portuguese East Africa**] *Anais Inst. Med. Trop.* Lisbon. 1958, Sept., v. 15, No. 3, 621–30, 2 maps. [11 refs.]

————. ii. Subsídios para o estudo da prevalência e distribuição das parasitoses intestinais no Distrito de Moçambique (A. O. P.). [**Prevalence and Incidence of Intestinal Parasites in the Mozambique District**] *Ibid.*, 631–8, 2 maps.

————. iii. Subsídios para o estudo da prevalência e distribuição das parasitoses intestinais no Distrito de Cabo Delgado (A. O. P.). [**Prevalence and Incidence of Intestinal Parasites in the Cabo Delgado District**] *Ibid.*, 639–46, 2 maps.

The English summaries appended to the paper are as follows:—

i. "On a survey done in the Niassa district, based on a single fecal specimen examined by the Hoffman, Pons and Jenner method, among native children from 3 to 16 years of age, the author found that 80% of 380 examinations done were positive to some intestinal parasites. The association of more than one parasite was found in 43·4% of the examinations. Ancylostomida was the parasite more frequently found (36·8%) and, from the pathogenic protozoa, *Entamoeba histolytica* was the one with the highest prevalence (8·15%). No relation was found to be present between parasitism and either sex or age group."

ii. "Based on a single stool examination of 980 children of the Moçambique district, the author found that the prevalence of intestinal parasites was 83·16%. Seven different species of helminths were found, three different species of pathogenic protozoa and two of non-pathogenic protozoa species. Ancylostomida with 46·73% prevalence rate was the more common helminth; *E. histolytica* with 4·79% the commonest pathogenic protozoa. Age and sex did not show any relation with prevalence rates of any parasites. 51·82% of the examined children presented more than one parasite in its stools, Ribaué being in the region where such association was more frequent (57·5% of cases). The highest infection rates were found in the Moçambique Island (100% infected) and Mogincual (92·5% infected)."

iii. "Of 740 stools examinations of African children in the Cabo Delgado district, Moçambique, 82·97% were positive for intestinal parasites. Among helminths, ancylostomida was the more prevalent, with 43·24% of cases, and, from pathogenic protozoa, *Entamoeba histolytica*, with 5·13%, showed the highest incidence. Prevalence did not seem to be related with age or sex. Parasitic association was present in 51·75% of the cases."

SCHAPIRO, M. M. & MOLINA, J. J. **Intestinal Parasitism among the Inmates of the Central Penitentiary, Tegucigalpa, Honduras.** *Trans. Roy. Soc. Trop. Med. & Hyg.* 1959, May, v. 53, No. 3, 270–77. [13 refs.]

1,492 healthy asymptomatic male prisoners, drawn from all parts of Honduras and aged from 15 to over 60 years, were examined for intestinal parasites, the first study of its kind to be undertaken in Honduras. Stool specimens were obtained after saline purgation, two preparations from each stool being examined. 27·4% were negative. Of those positive 46·2% had multiple and 53·8% single infections. *Entamoeba histolytica*, of which the small and large races were not differentiated, was found in 44·7% of all those examined, alone or in combination with other parasites. *Ascaris lumbricoides* [alone; the total, with multiple infections, is not given] in 8%, *Necator americanus* [alone] in less than 1%, and *Taenia saginata* [alone] in only 4 instances. No *T. solium* infection was found. In an earlier study, on the North Coast, 33·2% and 64·8% of those examined had single and multiple infections respectively, but only 17·6% had *E. histolytica*. *Trichuris trichiura*, the most common helminth on the North Coast, was comparatively rare among the prisoners.

It is considered that prison sanitary conditions, including the prevalence of flies and cockroaches, which are said to spread *E. histolytica* through their excreta, may account for the higher incidence of amoebiasis in the prison. The incidence of hookworm in the prisoners was notably low. In 1915 it was stated to be rare in Honduras, but more recently it had been assumed to be common. *B. B. Waddy*

JÍROVEC, O. Über die durch *Pneumocystis carinii* verursachte interstitielle Pneumonie der Säuglinge. [**Interstitial Pneumonia of Infants caused by** *Pneumocystis carinii*] *J. Hyg., Epidemiol., Microbiol. & Immunol.* Prague. 1959, v. 3, No. 1, 28–59, 8 figs. (4 on 2 pls.) [Numerous refs.]

The existence of interstitial plasmocytic pneumonia affecting young babies has been known since 1938, but its aetiology was only elucidated in 1952 by VANĚK and JÍROVEC [this *Bulletin*, 1952, v. 49, 908]. These authors demonstrated that the causative organism was *Pneumocystis carinii*, a sporozoal parasite found in rodents and other mammals, including man, from whom 4 cases of infection had been reported before the aetiology of the disease in question was elucidated. Since then it has been shown that this disease—which the present author proposes to call " pneumocystosis " or " pneumocystic pneumonia "—is widespread throughout the world.

In this paper the author has brought together all the known facts regarding pneumocystosis. The parasite, which is provisionally classified in the subclass Haplosporidia (Sporozoa, Protozoa), is found exclusively in the lungs of the patient, where it lives and multiplies in the lumen of the alveoli, as well as in the bronchioles and smaller bronchi. The uninucleate parasite, which is enclosed within a viscous capsule measuring 7–10 μ, has an elongated or rounded body (measuring 1·5–2 μ) covered by a membrane. Reproduction takes place by binary fission of the capsule and the enclosed parasite. After repeated divisions, the parasite undergoes a form of sporogony, in the course of which it first grows into a sporoblast filling almost the entire capsule, after

which the nucleus divides successively into 2, 4 and 8 nuclei, and sporogony is completed with the formation of a cyst containing 8 oval or pyriform spores, measuring 2×1 μ. As the result of the proliferation of the parasites, the lumina of the alveoli and bronchioles appear to be filled with a characteristic foamy mass.

Pneumocystosis is primarily a disease of infants up to the age of 4 months, but older children are also affected, whereas infection in adults is rarely encountered. The mortality varies from 10 to 60%, death usually being due to asphyxia produced by blockage of all the alveoli and bronchioles by proliferating masses of the parasites. The incubation period of the disease is about 20–30 days; its duration in fatal infantile cases varies from 1 to 2 weeks in 40% and 3–4 weeks in 23%. A short description is given of the clinical manifestations and histopathology of the disease. Its course is visualized as follows: when the parasites are inhaled they are drawn into the alveoli, where they multiply in the oedematous fluid, and produce an inflammatory reaction, manifested by the appearance of macrophages, hyperplasia of the alveolar epithelium and round cell infiltration of the interstitium.

Experienced paediatricians can diagnose pneumocystosis with some certainty in infants. In the incubation period there is diarrhoea, difficulty in drinking, the appearance of blue spots around the mouth and nose, and foamy matter found in the mouth after vomiting but in the later stages there is cyanosis, dyspnoea and respiratory distress. Serological methods (complement-fixation and skin test) proved to be unsatisfactory; and parasitological diagnosis can only be used post mortem. Up to the present all attempts to treat pneumocystosis with various drugs, including antibiotics, have failed.

Pneumocystosis is a nosocomial infection, occurring chiefly in institutions where infants spend the whole or part of their lives. Sources of infection might be infected infants or possibly older children and adults, from whom the parasites are presumably transmitted by the droplet method. It is also conceivable that rodents might act as reservoirs of human infection. These animals frequently carry latent infections which can only be revealed by provocative administration of cortisone or by other methods of activation. The prevalence of natural infection, which protects the animals against superinfection, explains the failure to infect rodents with human strains of *Pneumocystis*.

Since pneumocystosis is an infectious disease, the author recommends the adoption of appropriate preventive measures in institutions for infants, *viz.* disinfection of wards, isolation of the babies, their protection against infection from the personnel, destruction of domestic rodents etc.

In this comprehensive review of the present state of our knowledge regarding pneumocystosis the author has drawn upon the work of numerous observers, whose publications are fully listed in the references. *C. A. Hoare*

MOSER, Lis. Entwicklungsformen des Virus der interstitiellen plasmacellulären Säuglingspneumonie (einschl. der Versuche zur serologischen Identifizierung). [**Developmental Forms of Interstitial Plasma Cell Pneumonitis Virus (including the Results of Serological Identification)**] *Zent. f. Bakt.* I. Abt. Orig. 1959, v. 174, Nos. 5/6, 457–71, 17 figs. [13 refs.]

In stained preparations made from chick embryos infected by the allantoic route on the 10th day of incubation with a suspension of lung material from

an infant who had died of interstitial plasma cell pneumonia, intracellular granules were observed which were considered to be particles of the causative virus. Similar appearances were observed in cultures of chick embryo lung tissue infected with allantoic fluid. The appearances are illustrated in photomicrographs. The infection could only be passaged with difficulty in tissue cultures, and it was necessary to interpose occasional passages in chick embryos. The particles seen in tissue culture resembled those described in the lungs under the name *Pneumocystis carinii*. Some neutralization could be observed with the serum of an infant suffering from the disease. Complement-fixing antibody to an antigen prepared from infected allantoic fluid by precipitation with methanol in the cold was found in the sera of 129 of 152 patients with interstitial plasma cell pneumonitis, and in 7 of 325 children who were healthy or suffering from other conditions. *D. J. Bauer*

ENTOMOLOGY AND INSECTICIDES: GENERAL ZOOLOGY

[Papers on the toxic effects of insecticides in man are abstracted in the *Bulletin of Hygiene* under the general heading of Occupational Hygiene and Toxicology.]

ROUBAUD, E. Diapauses hivernales atténuées (sub-diapauses) chez les culicides. [**Attenuated Winter Diapause (Sub-Diapause) in Culicides**] *Bull. Soc. Path. Exot.* 1958, July–Aug., v. 51, No. 4, 520–24.

LU, Siu-Chin, MA, Teh-Chi & LEE, Chin-Peh. [**The Blood Preference of some Culicine Mosquitoes in Rural Areas of Nanking**] *Acta Entomologica Sinica.* 1959, Apr., v. 9, No. 2, 178–82. [13 refs.] [In Chinese.]

The English summary appended to the paper is as follows:—

"This paper reports on the results of investigation on the source of blood meal in mosquitoes by precipitin test in rural areas of Nanking during May to October, 1955. The engorged female mosquitoes were caught in various types of resting places, namely: human dwellings, cow sheds and other shelters in which domesticated animals and fowls live together.

"In the Nanking Area *Culex pipiens pallens* is in a very marked degree anthropophile. Of the 1,155 engorged females examined, 92% were positive for human blood, and only a negligible number reacted positively on fowls, horses, cows, sheep and pig blood. *Culex tritaeniorhynchus* is zoophile. Of 2,016 engorged females examined, 46·3% contained cow blood and 43·5% contained horse blood, as compared with 8·6% of human blood. *Armigeres obturbans* prefers cow blood to human blood.

"The relationship of these mosquitoes in the transmission of filariasis and Japanese 'B' encephalitis with reference to their blood preference and seasonal distribution has been discussed."

CLASTRIER, J. Notes sur les Cératopogonidés. VI.—Cératopogonidés d'Afrique *Occidentale Française.* [**Notes on Ceratopogonids. VI. Ceratopogonids of French West Africa**] *Arch. Inst. Pasteur d'Algérie.* 1959, Mar., v. 37, No. 1, 167–97, 24 figs. [15 refs.]

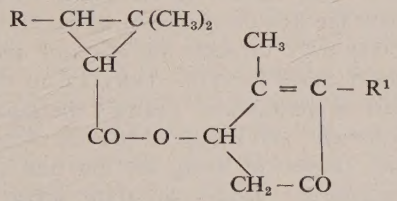
WEBB, J. E., Jr. **A Study of Insecticide Resistance in House Flies of Germany and France.** *J. Econom. Entom.* 1959, June, v. 52, No. 3, 419–21.

" Strains of the house fly (*Musca domestica* L.) from nine areas of Germany and France were laboratory tested to determine their susceptibility to DDT, lindane, dieldrin and malathion by topical application in acetone solutions. All strains were derived from flies which were collected in the field and reared in the laboratory until several successive generations had been tested. All strains tested were found to be significantly resistant to DDT, a Heidelberg strain having an LD-50 (lethal dose required for 50% mortality) of 71 times, La Rochelle 44 times, Orleans 36·7 times, and Munich 29·7 times as great as a non-resistant laboratory strain cited. Similarly five strains showed a moderate degree of resistance to lindane and five to dieldrin. None were shown to be significantly resistant to malathion."

TAGLE V., I. Primer caso autóctono de Hipodermosis en Chile. [**First Autochthonous Case of Hypodermosis in Chile**] *Bol. Chileno de Parasit.* 1959, Jan.–Mar., v. 14, No. 1, 15–17.

WEISER, J. Biologische Wirkung einiger synthetischer Pyrethrine. [**Biological Effect of a Synthetic Pyrethrin**] *Věstn. Českoslov. Zool. Spol.* Prague. 1958, v. 22, No. 4, 353–70, 2 figs. [23 refs.]

The pyrethrin I molecule may be represented as:—

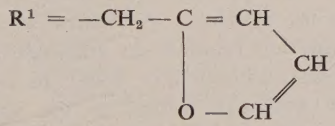


when R = —CH=C(CH$_3$)$_2$ and R^1=—CH$_2$—CH=CH—CH=CH$_2$.

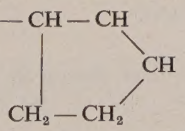
A number of analogous compounds have been synthesized and tested; as a result it is found that the molecule cannot be altered greatly without losing all its insecticidal effect (see ELLIOTT, *J. Sci. Food Agric.*, 1954, No. 11, 505). However, it has been possible to produce a few synthetic insecticides by varying the nature of R^1, which compare moderately well with natural pyrethrins. For example:—

allethrin R^1 = —CH$_2$—CH = CH$_2$

furethrin

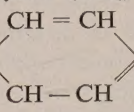


cyclethrin



In Czechoslovakia, it seems, they have been synthesizing further compounds and Dr. Weiser has been testing them for insecticidal action. He agrees with

Elliott's empirical rules for the groups necessary for high activity. Furthermore, he has found a new synthetic substance, which appears to be of high activity, by changing the isobutylene group on the acid part of the molecule.

In this compound, 

and R^1 (as in allethrin) $=—CH_2—CH=CH_2$.

J. R. Busvine

KHAJURIA, H. **Catalogue of Mammals in the Indian Museum (Zool. Surv.). II. Primates: Cercopithecidae.** *Rec. Indian Mus.* 1954, Mar., v. 52, Pt. 1, 101–28, 4 figs. on 2 pls. [23 refs.] **III. Primates: Colobidae.** *Ibid.*, June–Dec., Pts. 2/4, 195–220, 1 text fig. & 4 figs. on pl. [17 refs.]

MISCELLANEOUS PAPERS

WILSON, J. L. **Health and History in the Middle East.** *New England J. of Med.* 1959, Apr. 9 & 16, v. 260, Nos. 15 & 16, 751–7; 811–14, 2 figs. [31 refs.]

Because of its strategic geographical situation and its possession of more than half of the world's oil resources the Middle East is of great importance to the rest of the world. The author of this paper traces its history to the present time, starting with the first development of agriculture by the Sumerian civilization at about 5000 B.C., through the classical and Arab periods and the Turkish Empire which ended in 1918. Only 5% of the land is cultivable, the rest being arid desert or inhospitable swamp; the inhabitants are slavishly dependent on the environment, and modes of life are dictated by exigencies of land, climate and water. Levels of living are low and all the health indices indicate low health standards. Tables illustrate infant mortality, income, literacy, dietary conditions and other data to support this statement.

Health progress in such an area has complex interrelations and will not take place unless ignorance and poverty are also dealt with. Since the arbiters of social and economic change are the governments, there is intense interest in politics. Public welfare, including health, is emerging as a primary responsibility of government. The immediate need in the Middle East is to accelerate the pace of social improvement, through democratic government if possible. The medical schools need to be modernized, and basic science and public health require more attention in the syllabus. A medical educational programme to meet the needs of the situation requires an adequately trained and full time teaching staff. The medical schools now have an obligation to prepare a generation of physicians who will attend to the social and humanitarian responsibilities of their profession.

T. H. Davey

CHARTERS, A. D. **Recent Medical Research in East Africa.** *East African Med. J.* 1959, Nov., v. 35, No. 11, 595–606. [Numerous refs.]

This is the Presidential Address to the Conference of Physicians of East Africa, Nairobi, June 1958, and in it the author recalls many of the papers

published in the past decade which relate to medical conditions in East Africa. It is a long list, and though much of the work is of local interest, some of it has universal significance, and the account reflects very great credit both on the special research organizations and on individual investigators working in isolation.

It would be impossible to give a coherent short account of what is itself a series of brief comments and records. The arthropod-borne diseases come first and are followed by the virus diseases (including poliomyelitis), the bacterial diseases [but leprosy is hardly mentioned], the fungus infections, the helminthic diseases, malnutrition, and so on.

Much of the research has been done as a deliberate policy to deal with well known and important issues, and it is satisfactory to note that the interest seems to be spreading to cover not only these conventional problems, but also subjects likely to become more prominent as time passes—heart disease, psychological abnormalities, occupational diseases, skin diseases, etc. The author has given a useful skeleton account of a very considerable medical effort.

Charles Wilcocks

GELFAND, M. **A Doctor looks at the African.** *Central African J. of Med.* 1959, Mar., v. 5, No. 3, 97–100.

This is an important paper in which the author, who is exceptionally well informed and perspicacious in these matters, discusses the mentality of the African and the influences which may affect it. Diseases, of course, are prominent, and some of them—syphilis, malaria, diseases of the liver, malnutrition—either directly or indirectly may damage the brain. But it has been stated that the African brain is in general smaller than that of the European, and it has therefore been surmised that a formidable difference in quality exists. The author disputes this, partly on the ground that anatomical differences have been calculated on African brains which are likely to have been pathological and therefore not representative, and partly on other work which has indicated that no significant structural differences exist. Such differences as there are can be explained on the basis of culture and environment, especially in childhood.

The European child is soon introduced to mechanical toys, "and soon realises that the material world works on general laws and that he will not progress very far without personal striving". The thoughts of the African child are dominated by taboos, and events are explained as magical processes; natural inquisitiveness is frowned upon. "His whole being is dictated by 'Which spirit has been offended?'."

African culture has developed on lines which demand ability to memorize detail, and to conform in behaviour; it frowns on the expression of originality or profundity of reason. This means, however, that the African's manners and poise are better than those of the European, and that he shows less psychiatric disturbance than the European.

[The author did not add, but perhaps could have done so, that this stability is likely to be seriously disturbed if the African's old beliefs are broken before he can accept and assimilate the ideas and conceptions now being offered from what seems to him an alien culture.]

The author concludes emphatically that "no scientific proof has so far been

produced to show that there is a racial difference in intelligence. Any differences encountered are due to his educational and cultural environment".

Charles Wilcocks

REPORTS AND SURVEYS

GHALIOUNGUI, P., NAGATY, H. F., EL-SHAWARBY, K. & ESSAWY, M. A. E. **A Survey of Goitre, Parasitic and Nutritional Diseases in Ras El-Hekma and Adjoining Regions (Western Desert S.R., U.A.R.).** Reprinted from *Publications Inst. Desert d'Egypte*, 1957, No. 10, 75–90, 10 figs.

The work described is part of a survey of goitre, parasitic and nutritional diseases in different parts of Egypt. Ras El-Hekma, 222 km.west of Alexandria and on the Mediterranean shore, shares the characteristics of both arid and marine zones. Its inhabitants are semi-settled Bedouin, with one tribe of Berber origin. The population of the area is 5,514. Diet consists mainly of barley bread, onions, olives, figs and goat milk, all locally produced. Fish is rarely eaten.

116 persons, all males, were examined. Only one had an abnormal thyroid, an adenoma. Signs of deficiency of the B vitamins were found in over 30%. Schistosomiasis was found mainly in persons who had visited the Nile valley, but 2 who were supposed never to have left the neighbourhood were found to be infected despite an apparent local absence of vector snails. Intestinal parasitism was low: 74% of the 75 stools examined were negative. *Ascaris* (14·6%) and *Entamoeba histolytica* (9·3%) were the commonest findings. Trachoma was rife, but apart from that and vitamin B complex deficiency the population, as exemplified by those examined, seemed to compare well in health with that in other parts of Egypt.

B. B. Waddy

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